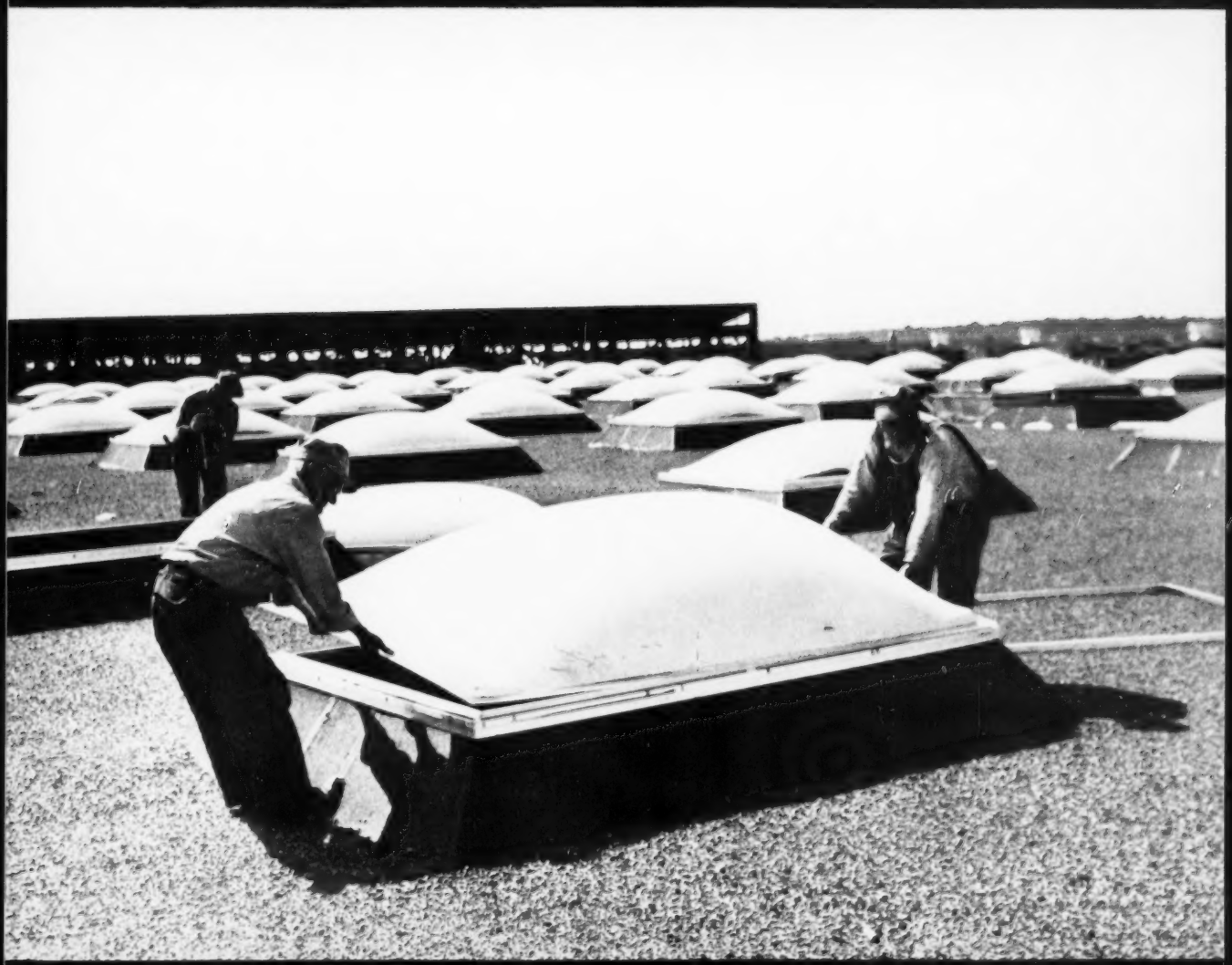
ENGINEERING NEWS-RECORD



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Making joint connections in sewers, culverts and other drainage structures can be expensive. Obviously, fewer joints reduce costs, save installation time and labor. This is one of the prime advantages of Armco Corrugated Metal Pipe. It is available in 20-foot lengths, or even longer, depending upon the limitations of hauling and handling.

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to bring your digging up to date

MODEL 1055 — 3½ yards
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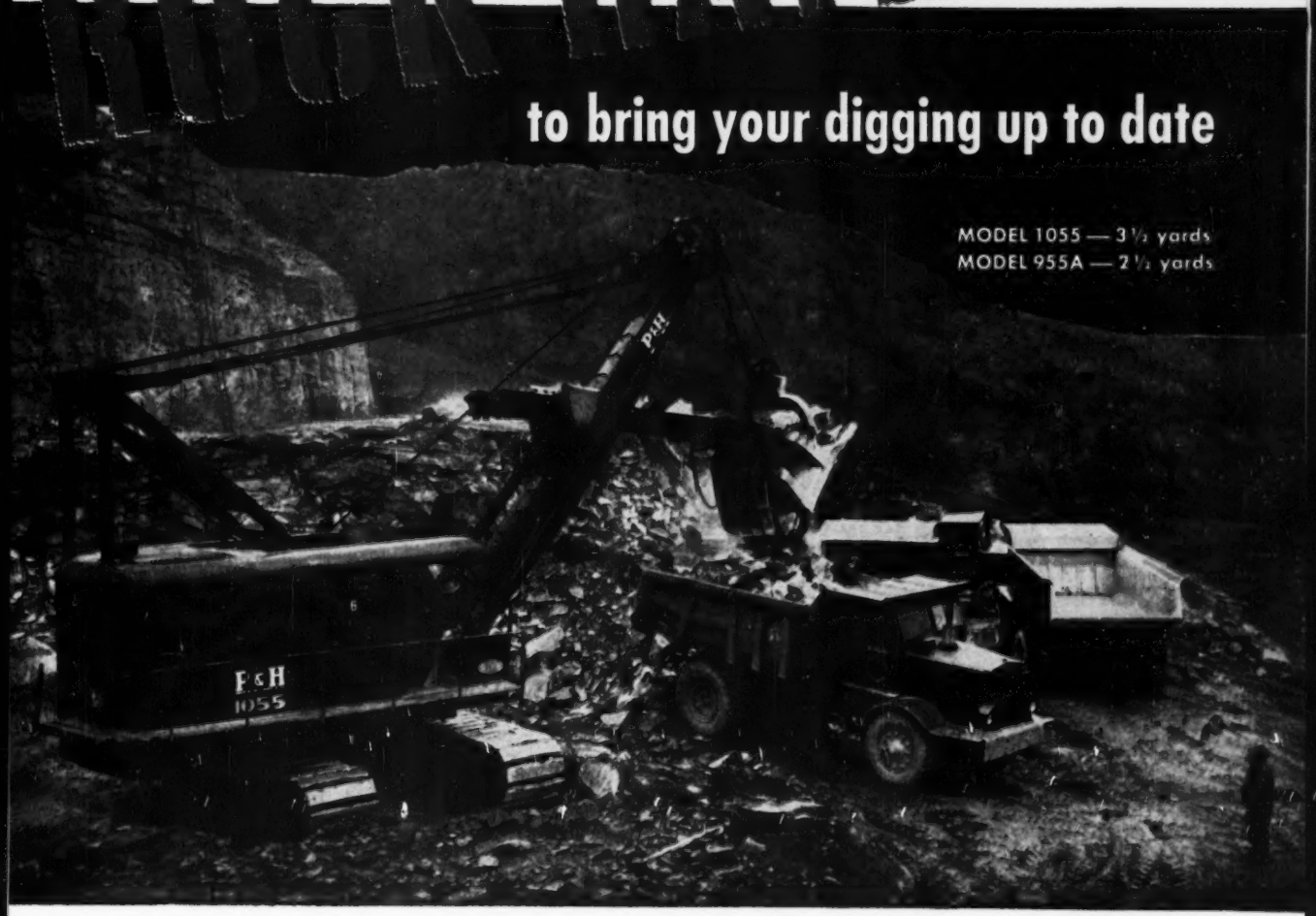

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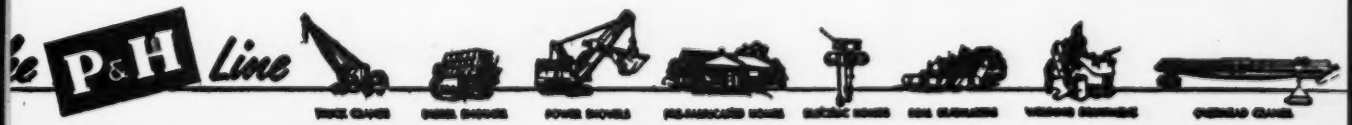

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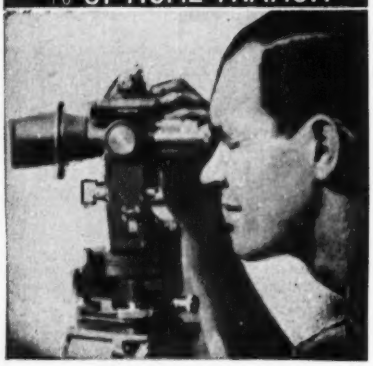
but **NO TRANSIT**
is *easier* to operate than the

F/S OPTICAL TRANSIT



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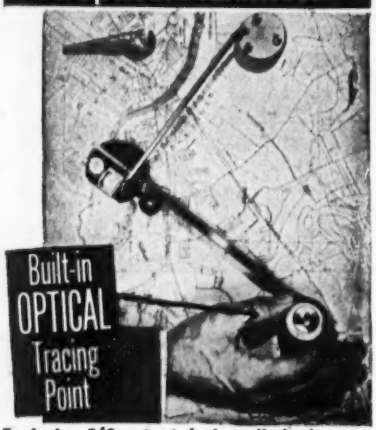

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Publisher

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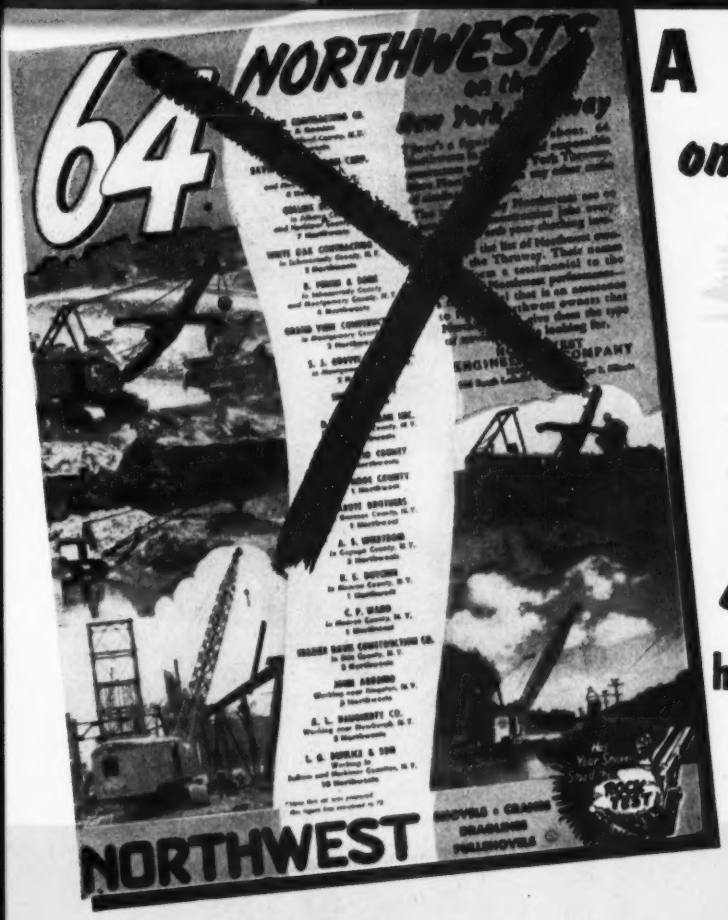

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81
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4 Northwests

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7 Northwests

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3 Northwests

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in Schenectady County, N. Y.
2 Northwests

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2 Northwests

B. PERINI & SONS
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4 Northwests

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2 Northwests

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A. S. WIKSTROM
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2 Northwests

R. E. DUTCHER
in Monroe County, N. Y.
1 Northwest

C. P. WARD
in Monroe County, N. Y.
1 Northwest

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5 Northwests

L. G. DEFELICE & SON
Working in Suffern and Herkimer Counties, N. Y.
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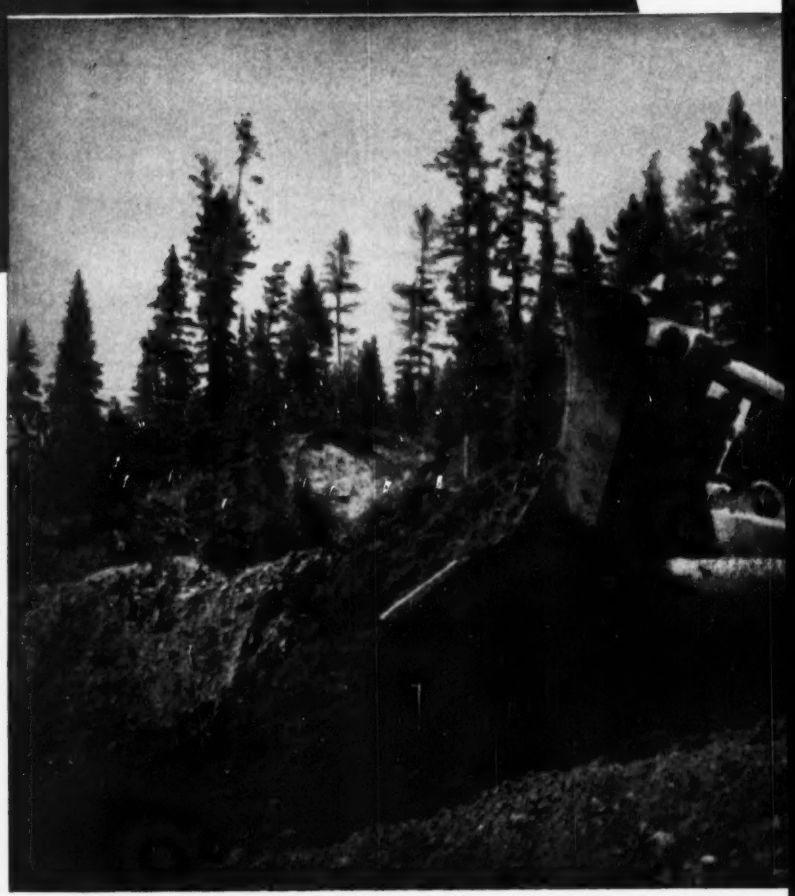

One of hundreds of pieces of Texaco-lubricated equipment used in the construction of Hungry Horse Dam, Montana

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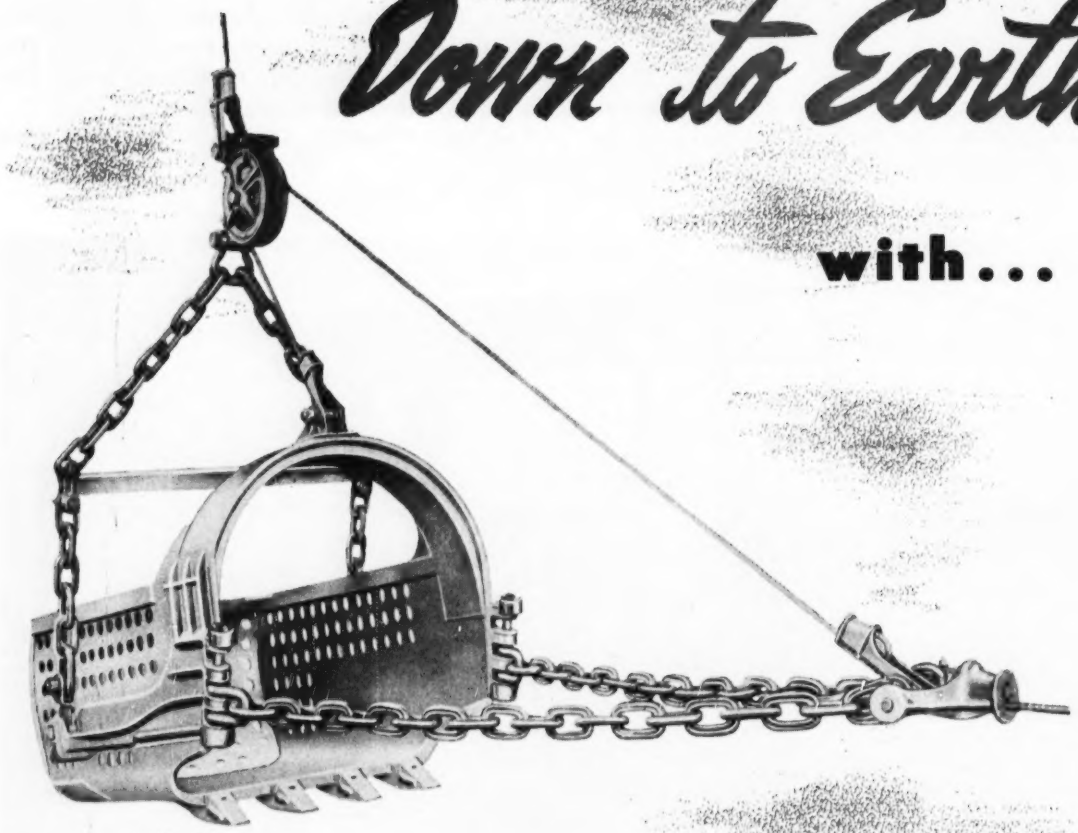

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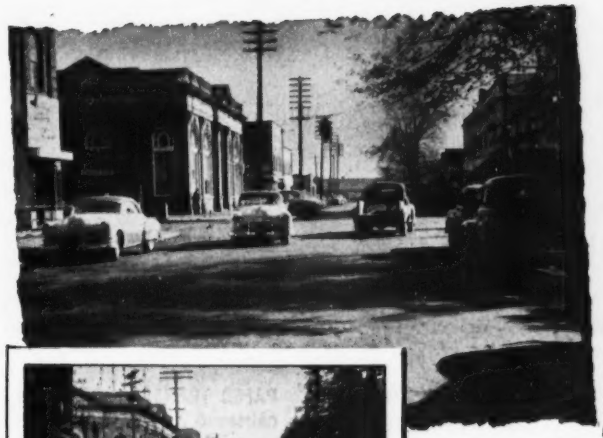

One section of W. 20th St. Built in 1922. Photos taken in 1923 and 1952.

Another section of W. 20th St. Built in 1923. Photos taken 1923, 1952.

Georgia St. Built in 1921. Photos taken in '23, '52.

9th St. Built in 1922. Photos taken in '23, '52.

Here today – *and still here tomorrow*

that's the story of Lorain, Ohio's

CONCRETE STREETS

Typical of Ohio's old concrete streets are these in Lorain on Lake Erie west of Cleveland. Many, like the examples illustrated here, have given outstanding service for more than 30 years.

Concrete streets like these serve so long and require so little maintenance that they deliver true ***low-annual-cost*** service. That's important to taxpayers, who foot the bills.

All over America there are concrete streets with similar service records. Yet today concrete streets can be built to render even better service as a result of improvements in design, materials and construction methods.

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How tracing paper is made and why ALBANENE* is Different

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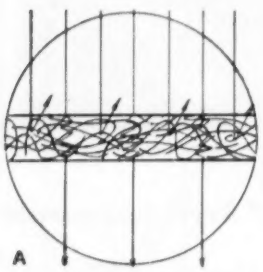
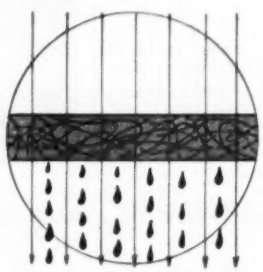


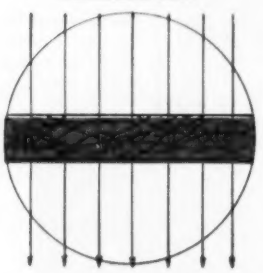
Diagrammatic enlargement of cross section of paper with high strength but low transparency. Fibers are surrounded by air, which has different index of refraction. Many light rays are bent back and do not get through.

SAME PAPER
TRANSPARENTIZED WITH FLUID MATERIAL



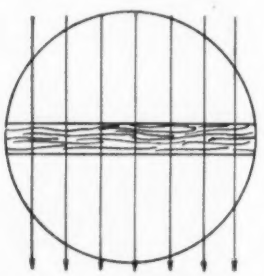
Same paper as "A", filled with oil or other fluid material, giving spaces between fibers same index of refraction as fibers. Reflection and refraction of light are reduced and paper becomes highly transparent. But transparency is not permanent because *fluids* "bleed" out.†

SAME PAPER
TRANSPARENTIZED THE ALBANENE WAY



Same paper as "A", filled with an inert synthetic resin, with correct index of refraction. This is how Albanene is made. Its transparentizer does not "bleed" out. Albanene holds its color and strength and is permanently transparent.†

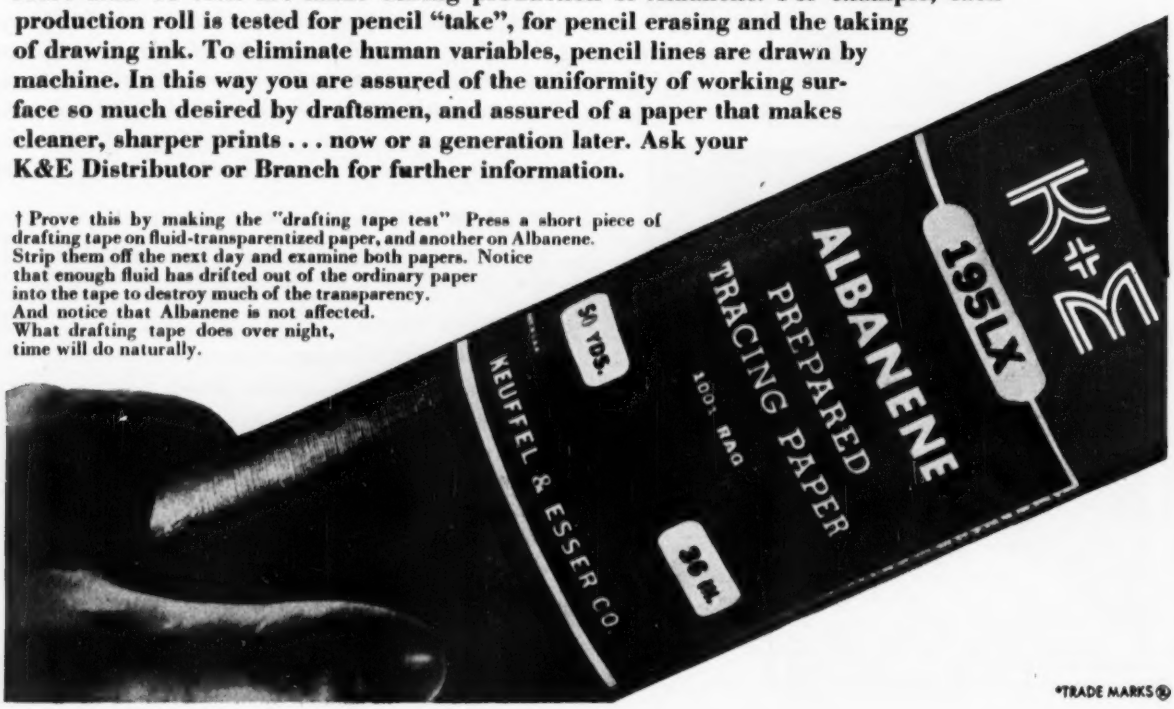
PAPER TRANSPARENTIZED BY
CRUSHING AND BEATING FIBERS



Papers are also transparentized at the mill by a "beating" process. The fibers are crushed, flattened and compacted. Reflection and refraction of light are reduced. But the process weakens the fibers and the strength of the transparent paper is low.

More than 15 tests are made during production of Albanene. For example, each production roll is tested for pencil "take", for pencil erasing and the taking of drawing ink. To eliminate human variables, pencil lines are drawn by machine. In this way you are assured of the uniformity of working surface so much desired by draftsmen, and assured of a paper that makes cleaner, sharper prints . . . now or a generation later. Ask your K&E Distributor or Branch for further information.

† Prove this by making the "drafting tape test" Press a short piece of drafting tape on fluid-transparentized paper, and another on Albanene. Strip them off the next day and examine both papers. Notice that enough fluid has drifted out of the ordinary paper into the tape to destroy much of the transparency. And notice that Albanene is not affected. What drafting tape does over night, time will do naturally.



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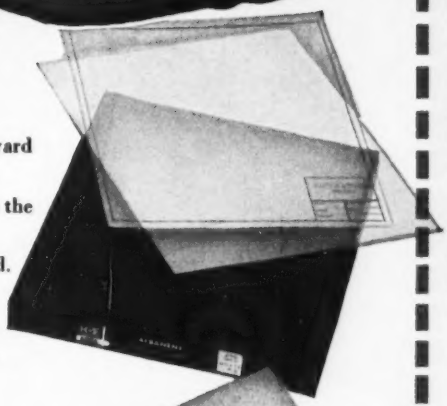
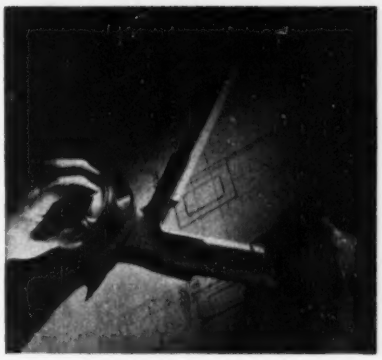
and Better!

The Right Angle



AVAILABLE IN MANY FORMS FOR MANY USES

Albanene comes in 20-yard and 50-yard rolls in various widths and in three different weights. For those who like the convenience of cut sheets, a new Albanene package has been designed. It strongly protects the paper in shipment and storage, and may be opened without mutilating the container, thus serves as a dispenser in drafting room or stock room. Albanene cut sheets can be supplied imprinted to your specifications.



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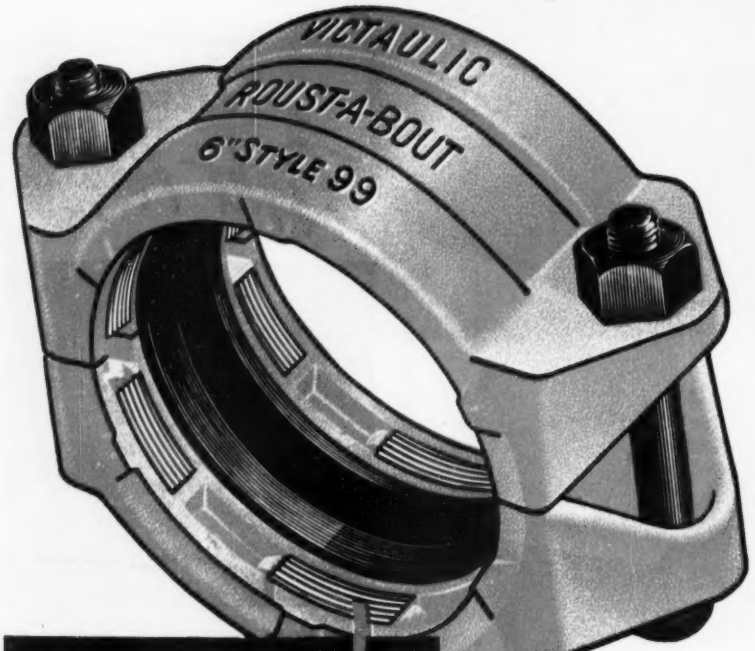

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- You can use *plain* or *beveled end* pipe!
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- You need only one tool—a *socket wrench!*
- Roust-A-Bouts are simple and factory finished!

For your next job—insist on the best—Victaulic Roust-A-Bouts. They're available at all Victaulic Stocking Supply Houses in pipe sizes—2", 2½", 3", 3½", 4", 5", 6", and 8".

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READER COMMENT

Architects and engineers

SIR: Regarding your editorial on Frank Lloyd Wright's television comments (ENR Nov. 5, 1953, p. 128), I want you to know your comments are well timed and well placed. Too long have we architects forgotten how much we owe to our fellow engineers for the realization of our creations. I share the sentiment of many of my colleagues that Mr. Wright's theory has long been detrimental to our profession. Yours for better professional unification.

NORMAN A. HOMSY
Allston, Mass.

Performance standards

SIR: I have read with interest the several articles in the Oct 29, 1953, issue of ENGINEERING NEWS-RECORD reporting actual cases where historical practices in the construction industry are being superseded by new and more economical methods.

The construction techniques being used on the French airbases as well as the labor and jurisdictional activities associated with the panel enclosure walls of some new American skyscrapers should stimulate and give momentum to te already fast growing belief that a need for something far more pertinent than a set of plans and specifications for one frozen design exists. I refer to the need for performance type of requirements or standards all entirely divorced from any material or construction method which at one time, for one place and under one set of conditions might have been determined by one group to be the "last word" or the "best."

To many U.S. engineers and architects 600 psi. concrete, as being used for bearing walls on the French airbase buildings, would be considered a sub-standard material, probably just because most building codes and material specifications generally fail to list concretes having a 28-day strength of less than 2,000 psi. Also, without endorsing the claims for low thermal heat loss values and other pertinent properties such as low volume change of this popcorn concrete, it appears that European know-how, experience, and backing supports new construction methods to the extent that they are being used not only for their adaptability, but because of cost savings.

Where an innovation is proposed, normal control would seem to require a set of rules, yardsticks or tests by

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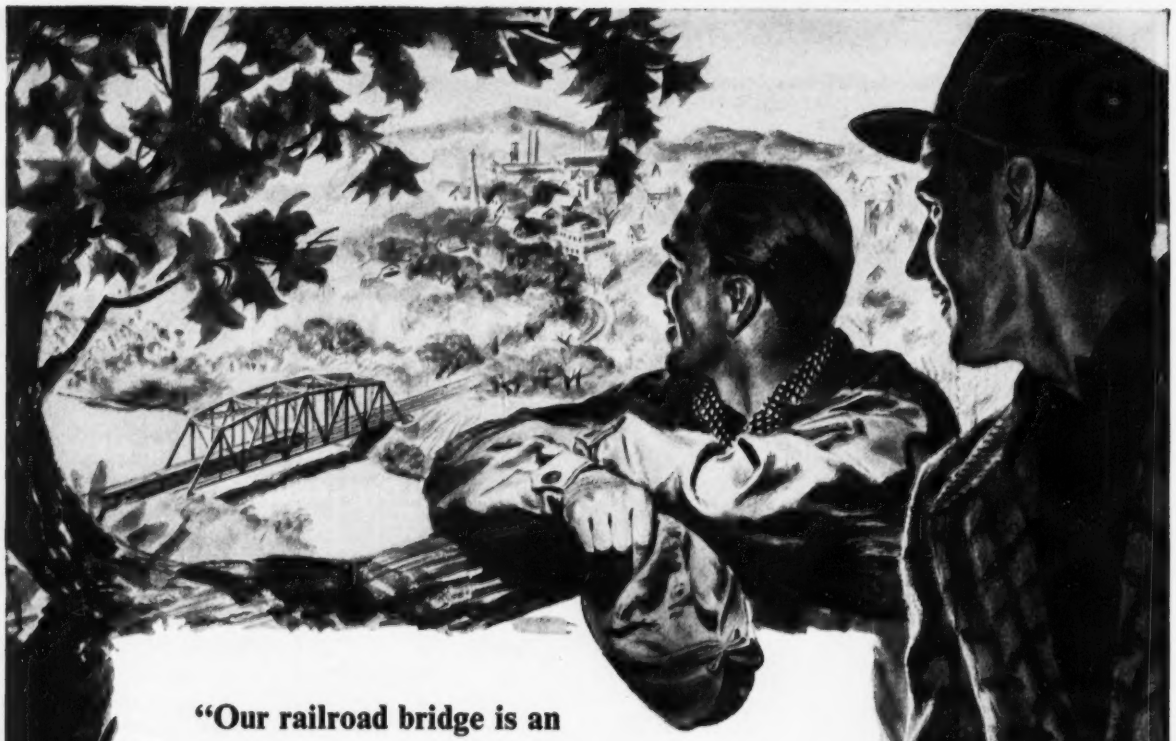

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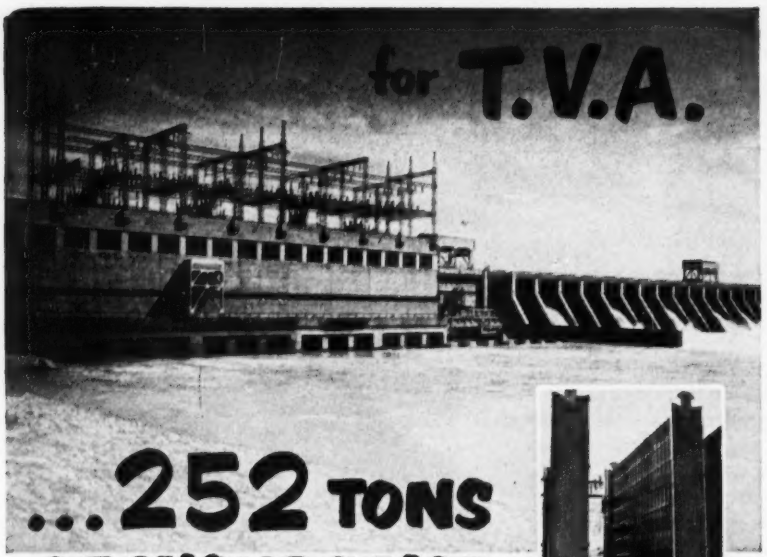

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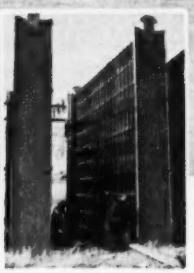

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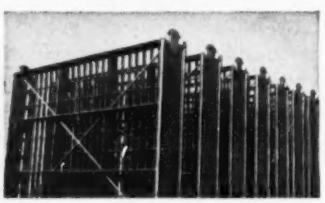

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READER COMMENT

which it could be judged in forming a reliable determination on expectancy of performance and useful life. Such yardsticks and tests in a complete (or reasonably complete) range do not at present exist. Their non-existence may well be one of the reasons for Mr. C. P. Street's recent statement to the Portland, Ore., Chapter, A.G.C. that "construction today is based on developments in foundations and use of steel and concrete which date back to 1875 and earlier—with little fundamental change." (ENR Oct. 29, 1953, p. 98).

Congratulations on the unusually interesting and stimulating issue of Nov. 24.

RALPH R. BRITTON
Washington, D. C.

No fault

The description of proposed structures for the projected St. Lawrence River power project in our issue of No. 12, p. 21, stated that the present plans call for "a dam and powerhouse across the river at the lower end of Barnhart Island and another dam across the long fault at the upper end of the island." There is no fault at the upper end of the island. There is a rapids called the "Long Sault," and that was what was in the description of the project as written originally.

CALENDAR

Engineering Institute (construction costs and planning) University of Wisconsin, Madison, Dec. 7-8.
Annual Highway Conference, Maine Section, American Society of Civil Engineers, University of Maine, Orono, Dec. 18-19.
American Road Builders Association, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., Jan. 5-7.
National Constructors Association, annual meeting, Hotel Commodore, N. Y. City, Jan. 12-14.
Highway Research Board, annual meeting, National Academy of Sciences Building, Washington, D. C., Jan. 12-15.
National Association of Home Builders, annual convention and exposition, Conrad Hilton and Sherman hotels, Chicago, Jan. 17-21.
Land surveyors conference and exhibition, University Commons, Rutgers University, New Brunswick, N. J., Jan. 23.
Mason Contractors Association of America, Sherman Hotel, Chicago Jan. 24-27.
Conference on Prestressed Concrete, University of Toronto, Toronto, Ont., Jan. 28-29.
Associated Equipment Distributors, Waldorf Astoria Hotel, N. Y. City, Jan. 31-Feb. 4.
California Industrial Safety Conference, Palace Hotel, San Francisco, Feb. 11-12.
N. J. section American Water Works Association, winter meeting, Essex House, Newark, N. J., Feb. 16.
American Concrete Agricultural Pipe Association, Fairmont Hotel, San Francisco, Calif., Feb. 24.
American Concrete Pipe Association, annual convention, Fairmont Hotel, San Francisco, Calif., Feb. 25-27.

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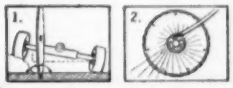

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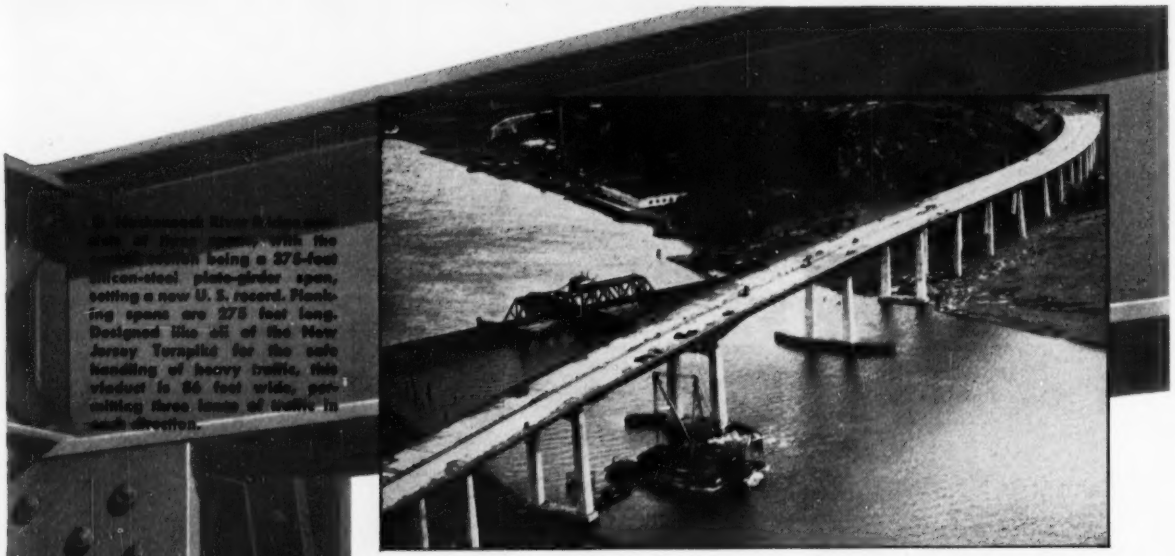

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● **One of the vital links** of the 118-mile New Jersey Turnpike is the $9,500,000 Hackensack River Bridge opened recently. This important portion of the new toll highway which connects the New York metropolitan area with points south, is 5,623 feet long. Spans for this viaduct were fabricated and erected by the American Bridge Division, United States Steel Company.

● **Pittsburgh is proud** that its new XLO Structural Steel Primer was used to safeguard these record-size girders during transit and erection. This new kind of primer is derived from linseed oil, combined with red lead and iron oxide pigments to provide protection for all kinds of fabricated structural shapes during transit, erection and before application of field coats. It is also furnished with 100% red lead, if desired. A variety of IRONHIDE coatings are also available in a range of colors suitable for field coat application.

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THE CONSTRUCTION WEEK

- **Hope for Mackinac?**—The Mackinac Bridge Authority is set to make one more try to get financing before the end of the year for its proposed long structure across the Straits of Mackinac.

  Key to the situation is this: Unless the authority sells the $96-million revenue bond issue it needs by Dec. 31, it will lose a $417,000 annual grant that the state legislature has offered for operation and maintenance of the bridge.

  The legislature might be prevailed upon to renew its offer—but the authority doesn't want to take a chance on that if it doesn't have to. That's why it is trying now to get financing from several large life insurance companies, despite the advice of the B. J. VanIngen Co. (New York investment house that earlier, and unsuccessfully, tried to round up a syndicate to underwrite the bond issue) against attempting to market the issue this month. But Prentiss M. Brown, bridge authority chairman, is counting on a recent apparent revival in the bond market to make financing possible for the proposed crossing.

- **Sale conditions**—If the federal government finally does sell its Central Valley project to the State of California, it will put some rigid restrictions into the contract of sale. As a result of recent meetings in Washington between state and federal representatives, restrictions were outlined in about this way:

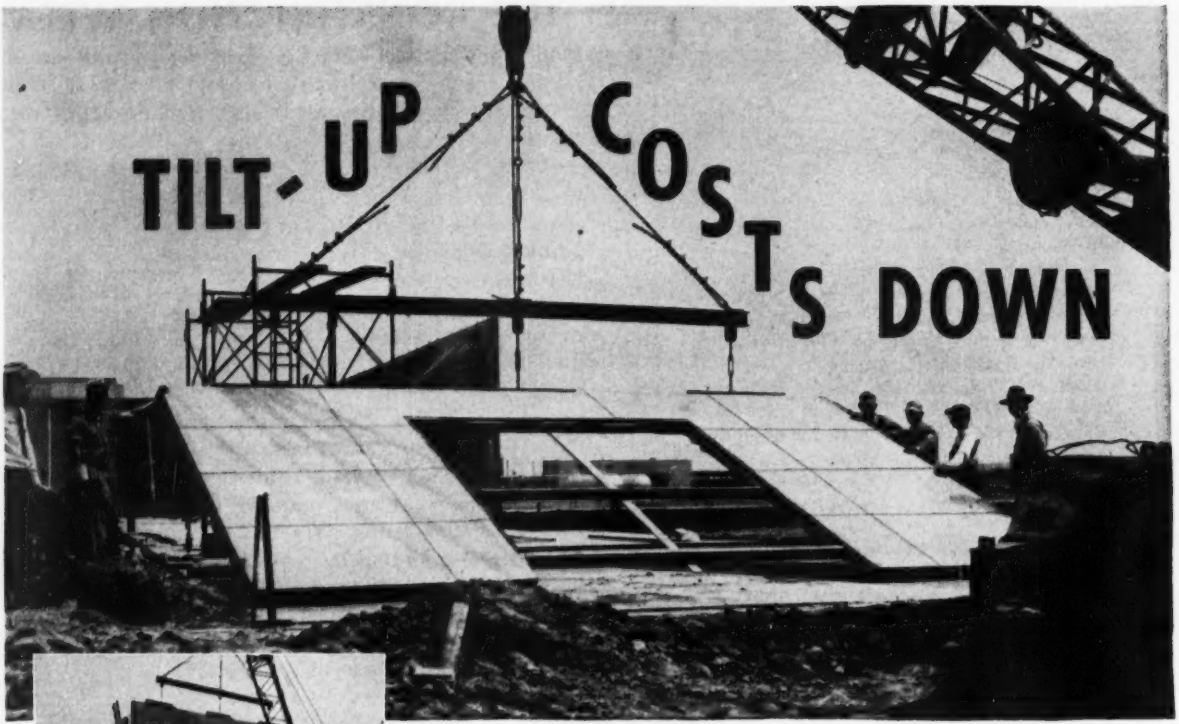
  All authorized units of the project would be built; California must use federally furnished data on "present worth" of the project, along with federal estimates of anticipated power, water and irrigation revenues. In return, the federal government would finance irrigation works, interest-free.

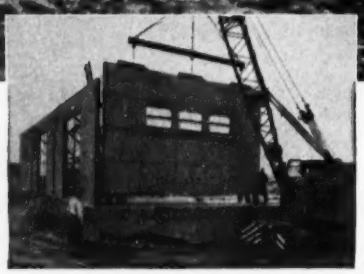
  More than $400 million has already been invested by the U. S. in irrigation, flood control and power projects for Central Valley, and another $100 million of work has been authorized. Proposed developments on the Tinity River, and the Sacramento Canals would add another $300 million to costs. More than a half-million kw of capacity is involved in CVP projects already in operation, and nearly a quarter-million more would be installed in work authorized.

  California officials will digest the information they have, and also other data to be supplied. Then they will meet again with federal people for more discussion on the matter.

- **Keep that date**—A new policy under which contractors on state projects will have to list completion dates for jobs—and then pay daily penalties if the job runs past that time is aimed specifically at getting work under way fast, say state officials.

  Budget Bureau engineer Frank Turner commented: A situation occurred some time ago where a contractor waited a year before starting work—and the state couldn't do anything about it. "That won't happen again," he added.





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The Administration may take an entirely new tack on public housing. There's no thought of ending present public housing program. As things stand now, the Administration will ask for—and get—authorization for another 20-thousand public housing starts, more or less, for the year beginning next June 30.

The new idea is to build public housing that the tenant eventually can buy. This would have the advantage of shifting title to the public housing units from a government agency to a private home owner.

The new housing would be row houses or house-on-a-lot projects, rather than the multi-story apartment projects which have characterized public housing projects up to now.

Initial phases of such a program would be the same as now up to the point where a renter is ready to purchase his dwelling. At that point regular sources of credit would get a crack at this new market—and the federal government would aid the sale with a new guarantee deal.

A 40-year mortgage and low down payment might get an FHA-type guarantee to make the deal attractive.

•

There's a new idea on slum clearance and urban redevelopment, too. Aim is to put a new lever on cities to get them to prevent further deterioration of housing areas that might become slums. Housing officials talk about writing minimum standards into law—and only those cities that enforce such minimum codes would be eligible for federal slum-clearance grants.

The report of the President's housing committee will discuss some of these things in more detail. It will be used as a basis for talks on legislation between White House and congressional leaders scheduled for week after next.

The Administration's program will be laid down by the President to Congress in January.

Housing officials talk about getting a single-all-inclusive law on housing matters out of Congress by April. But odds are against the variety of issues—public housing, Fanny Mae, VA, FHA, slum clearance—going through Congress in one package.

•

Next year's military construction budget will get a ceiling, then the Army, Navy and Air Force will cut the pie for specific projects. President Eisenhower will announce only an overall figure in his January budget message to Congress.

The services will seek project money later—during hearings before congressional appropriations committees. General requests are being firmed up this week to go to Secretary Wilson. The Pentagon's final estimate will not go to the White House before the year-end.

•

Engineers are now screening military construction requests. Assistant Secretary of Defense Floete is staffing his shop (see page 21) with career engineers from the services. Economists and statisticians did the bulk of this work under the previous regime.

•

Political battle over Resources for the Future conference got under way before the meeting began. Five organizations pulled out, charging they did not get representation on panels of interest to them.

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Defense construction policies go under new expert direction

Properties and Installations Office, operating with small staff, to use consultants for special missions

The Properties and Installations Office of the revamped Defense Department is ready to roll. Assistant Secretary Frenklin G. Floete has brought together a tightly knit staff of experienced specialists to lay the groundwork for determination of policy on construction, maintenance and real property management.

Rudolph W. Weitz, president of the Weitz Construction Co., of Des Moines, Iowa, Director for Maintenance, is the latest addition to the three-man team that reports directly to Floete. His appointment last week rounds out the triumvirate that directs the three-pronged operation for the assistant secretary. Rear Adm. Joseph F. Jelley, who handles construction, and Ira D. Beynon, who heads the work on property management, have been on the job for some time (ENR Sept. 24, p. 21).

A compact staff, numbering only 55, will be handling the multiple duties of the Properties and Installations Office. Jelley, for example, will operate with about 20 persons—12 engineers and eight clerical works.

But, Floete's staff will be supplemented as needed by top-flight consultants from outside the government.

• **Three special divisions**—To aid the constant review, analysis, surveillance and policy-direction of the military construction programs of the three services, Jelley and Floete split the field three ways and put a carefully selected engineer in charge of each of three divisions. Briefly, the three groups are known as the Technical, the Planning, and the Analysis Divisions. A fourth group, separate from the other three but working closely with them, is responsible for civilian components—facilities for the National Guard, Navy and Air Force Reserve units.

Jelley pulled men with expert knowledge right out of the military departments to head these divisions. Chief of the Technical Division and senior assistant to Jelley is Fred S. Poorman, former deputy chief of engineering for military construction in the office of the Chief of Engineers. Poorman has had a long and successful engineering career, capped by more than ten years experience with military construction for the Corps of Engineers.

• **Setting new standards**—Poorman and his group are giving priority to developing functional, or facilities, criteria—how many such structures as magazines, tanks, hangars, and warehouses are needed for various classes of installations. Answers to those questions will mean a real money saving. And the setting of relatively uniform standards on a quantity or cubage basis for such supporting facilities will give solid help to the military construction agencies in their effort to cut the building bill.

Less promising as a money saver but equally significant is the second objective of developing useable standards for design and construction.

Standardization will be confined to engineering fundamentals such as loads and stresses; it will not seek uniformity in design, materials or methods.

Where the services fail to agree on specific criteria, a top-flight consultant would be brought in to study the question and recommend the standards.

On such controversies, Poorman will act as coordinator.

Heading the analysis and review division is Edward J. Sheridan formerly with the Defense Department Committee on Management. Sheridan was in the office of the Chief of Engineers for ten years before joining the staff of the Secretary of Defense in 1950.

Sheridan's group applies the yardstick of need, feasibility and economy both to separate facilities and to complete installations. On the basis of these determinations, the Defense Department eventually decides what military works should be included in the construction program submitted to the budget bureau and to Congress. The Analysis Division has to determine what is the minimum facility to meet a specific need—it is an engineering question, and it will be handled by engineers.

• **Planning objectives**—Toughest of the assignments for Jelley's division chiefs probably is the one handed Lewis E. Dowling, who heads the planning group. Dowling and his small crew are to develop the guide lines for integrated construction planning of the three military services. In that broad field, they work on plans for an annual normal program, for full mobilization, and for work to relieve a depression.

Jelley drafted Dowling from the Bureau of Yards and Docks of which Jelley was chief until Nov. 3. Dowling had been one of the bureau's planning heads since 1946. Before that, he served BuDocks as a structural engineer.

Dowling's division is now studying a factual survey of the planning system used by the three services. Object of this long-range study: to work out a more uniform process of developing projects from conception to appropriation by Congress. In line with the survey, the division is also looking into the nature and use of existing master plans of the services.

Separate from these divisions but related to them is the unit that looks after reserve forces facilities. In charge of this work is Col. Frank Collins, an Air Force officer formerly with the Air Force engineers and the Manpower and Personnel Office of the Defense Department. Collins will assess the need for reserve facilities in any area. He will leave the engineering review to others.

• **Role of consultants**—Backing up and enlarging the engineering scope of the construction team are the outside consultants who take on special assignments.

Two well-known leaders in engineering construction have already signed on to do a job. John Kyle, chief engineer of the Port of New York Authority, is going to Europe to look into the question of overlapping inspection services on NATO construction projects in France. And L. S. Corey, president of the Utah Construction Co., San Francisco, has agreed to give a good share of his time every month to helping Jelley.

Other directors under Floete are organizing their activities in much the same way as Jelley.

Antitrust suits

Supreme Court to hear arguments in lathers and plasterers cases

The Supreme Court this week decided to hear arguments in two related cases that may have considerable impact on the construction industry.

The cases involve proceedings under the Sherman Act by the government against these groups:

- The Employing Lathers Assn. of Chicago and Vicinity; and Local No. 74 of the Wood, Wire, and Metal Lathers International Union of Chicago, Ill.; and
- The Employing Plasterers Assn. of Chicago; and the Journeymen Plasterers Protective and Benevolent Society, Local No. 5.

So far, the government has not been able to make stick in court the charges it filed in both civil and criminal cases in 1952 against the employers' associations and the two unions. The charges are basically this: That the associations and the unions conspired together to limit those who may engage in the business of lathing and plastering contracting in the Chicago area; that the cost of building construction in the area has been thus artificially increased; and that interstate commerce in the lathing and plastering and related building materials has been unlawfully restrained.

Last July, Federal Judge J. Sam Perry, in Chicago, dismissed the government's cases on the ground that the alleged conspiracy and monopoly were limited to rendering local labor services and that their effect upon interstate commerce was too "remote and conjectural" to constitute a violation of the Sherman Antitrust Act.

The Justice Department in making its appeal to the Supreme Court late in October said the court had never directly ruled on the question whether restrictive competitive practices—such as those charged in these cases—in the building industry comes within reach of the Sherman Act. The government also noted that there are many areas of the construction industry which it believes are "plagued by limitations on competition" which the Sherman Act plainly bars.

The employer associations, opposing review of Judge Perry's decision, said the construction industry has always concerned itself with the use of goods after they have reached their destination. It called attention to cases which they say show that a conspiracy to control a local building market is not a violation of the act.

City orders steel pipe after tiff over concrete

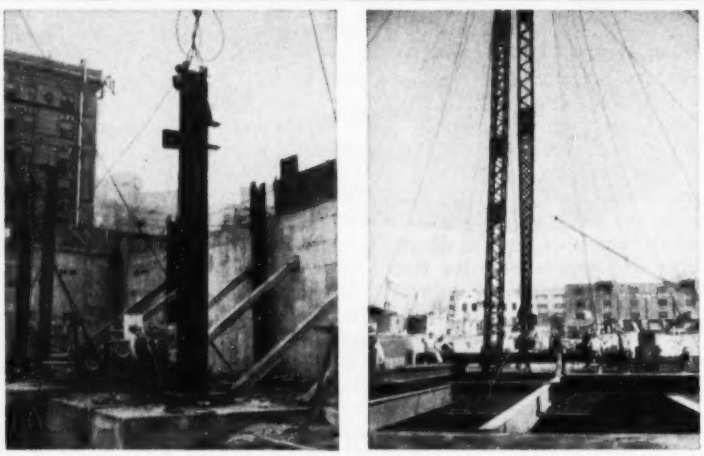
The city council of Regina, Sask., has decided to switch from prestressed concrete to steel pipe for its new 36-mi water supply line. Construction of the line had started in 1951 with prestressed pipe but was discontinued last year when trouble developed.

A section of the prestressed, which was being manufactured and installed by Preload Company of Canada, Ltd., failed last winter (ENR Feb 19, p. 47). An investigation (ENR May 7, p. 24) led to findings that corrosion of prestressing wires was responsible. However, two panels of consulting engineers, one representing the company and the other the city, disagreed on what caused the corrosion.

Although it appeared that a satisfactory solution might be worked out so that Preload could proceed with the job, the city later decided against carrying on with the work. Preload has instituted a breach of contract suit.

In the bidding for a new start, the American Pipe and Construction Co. submitted the low bid for concrete pipe, and was recommended by the waterworks department and the project engineer. But, the city council unanimously rejected the proposal.

A $3.1-million contract for 36-in. dia steel pipe was awarded to Dominion Bridge Co., of Vancouver.



BASEMENT COLUMNS have been erected (left) for the first building of the Mile High Center, Denver, and the derrick jumped (right) for the next tier.

Unusual facade for Denver skyscraper

Steel is now being erected for the first building of the Mile High Center in Denver, Colo. The $15-million, air-conditioned structure will rise 23 stories without setbacks above a ground floor that will be entirely open, except for a glass-enclosed lobby.

The tower, at 1700 Broadway, will be the main building in the center, which is being developed by the George A. Fuller Co. and Webb & Knapp, Inc. Other buildings on the 301x266-ft site will be a transportation building to be used as an airline terminal, a bank, a restaurant and a parking garage.

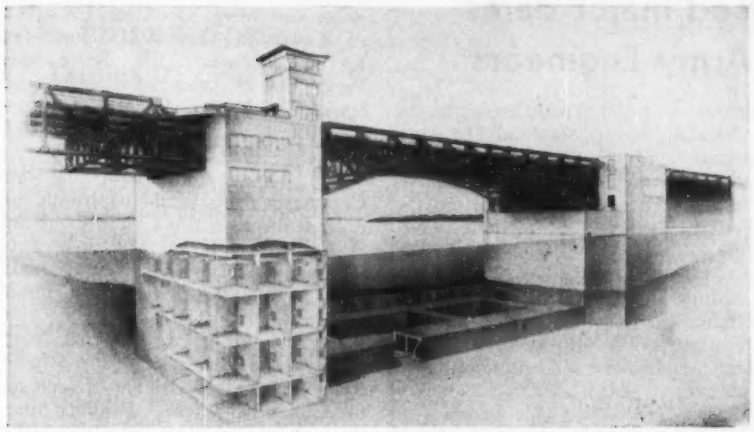
In plan, the tower is 152x127 ft, providing 18,000 sq ft of rentable area on each floor. Vertical transportation will be provided by four high-rise and four low-rise elevators.

Outstanding features of the building include its facade and the use of high-tensile bolts for connections in the steel frame.

The exterior of the building will consist of large areas of glass in aluminum sash interspersed with gray anodized aluminum panels over the spandrels and columns. Above the spandrel panels and separated from them by 12-in.-high glass panes will be 2-ft-deep horizontal panels of eggshell-white, porcelain-enameled steel which will cover perimeter heating and cooling units. Similar panels, 10 in. wide, will be applied vertically to cover air risers. To the vertical strips will be attached aluminum guide rails for a window washers' platform, which will be suspended from the parapet.

A penthouse enclosing mechanical equipment and tanks also will be covered with eggshell-white, porcelain-enameled steel.

Steelwork is expected to be completed by the end of January, the concrete floors by the middle of March, and the facade by March 30.



SEMI-FLOATING PIERS will support a $6.5-million bridge over the Duwamish River at Seattle, Wash. Cellular construction makes piers buoyant.

"Semi-floating" piers, geared to tides, to support bascule bridge at Seattle

Bids were opened last week for construction of "semi-floating" concrete piers to support a $6.5-million bascule bridge across the Duwamish River in Seattle, Wash. General Construction Co., of Seattle, submitted the low bid of $1.4 million to the Washington State Highway Department.

"To the best of our knowledge, this adaptation of the semi-floating principle to bascule piers is unprecedented," said Bruce V. Christy of the Seattle engineering department, supervising engineer for planning.

This type of design is necessary because of poor foundation material—fine black sand on soft clay.

The 57th St. piers in New York City have a somewhat similar design, as has the foundation for the New York State Thruway across the Hudson River at Tappan Zee. Both of these projects differ from the Seattle development in important particulars, however.

A unique feature of the bascule bridge substructure design is provision for the effects of varying tide levels. This is needed because the bridge is only a short distance from Puget Sound. Flooding ports at extreme low-tide level will allow flow of water in and out of an impounding chamber. As the tide rises, water will flow into the chamber, balancing the tendency of the rising tide to lift the piers.

The pier shafts are cellular, reinforced concrete structures, connected under the channel bottom by two reinforced concrete cellular struts. They lack only 9 ft of draft to make them completely floating.

Plans call for fabrication of the first, lower unit of pier and strut assembly in a drydock. Then, it will be towed to either a fitting-out pier or the bridge site.

As the pier shafts are built up, the pier assembly will sink lower into the water, placing the connecting struts deep enough under the surface to permit passage of river craft after the assembly has been swung into final position. The pier shafts, 150 ft apart, then will be further built up in place until the pier has been landed in permanent position on the floor of the channel.

The pier sites will be dredged to allow placing of each pier at the desired depth. They then will be backfilled as much as 30 ft to the design level of the channel.

General-construction supervision will be under the State Highway Department. Work on the plans began under former City Engineer Ralph W. Finke and has been carried ahead under William E. Parker, present city engineer.

Tests of steel piles conducted in Chicago

A test project to determine the bearing capacity of H-beam steel piles for use under skyscrapers in Chicago's Loop area has been undertaken by Armour Research Foundation of Illinois Institute of Technology for the U. S. Steel Corp.

Nine steel piles of three different sizes have been driven into the ground to various depths on a West Side site. They will be subjected to loads up to 800 tons.

Deformations of the piles will be measured with electric strain gages.

Record road budget

California will spend $205 million on major projects

A state highway budget believed to be the largest ever adopted by any state for free roads has been authorized by the California Highway Commission for the fiscal year starting July 1, 1954. A record figure of $205,110,000 is allocated for major construction.

Improvements will be made to 585 mi of highway, including many sections of multi-lane urban freeways, intercity expressways, and rural routes.

Allocations of $145,387,000 are made for major construction projects and engineering, and $59,723,000 for acquisition of rights-of-way for future highway improvement, out of a total of $267,241,290 for all state highway purposes.

The 1953-54 budget provided $247,000,000, of which $190,000,000 was allocated for major construction.

Since state law permits awarding contracts on or after April 1 to take advantage of good construction weather, some projects will be advertised for bids starting in January.

The largest single allocation in the budget is $8.5 million for 3.9 mi of the Ramona Freeway (U. S. 70-99) through and near El Monte. Next largest is a $6-million item for 4.7 mi of U. S. 40 on its new freeway location through Richmond, El Cerrito, and San Pablo.

Standby toll road act introduced in Georgia

Although the state administration is not sold on the advisibility of a toll road venture, standby legislation will be considered by the Georgia legislature in case it is decided to participate in the proposed five-state plan for a north-south turnpike from the Chicago area to the coast of Florida (ENR Oct. 8, p.73).

The bill, which is reported to have the support of Gov. Herman Talmadge, would create a new Georgia Bridge and Turnpike Authority (the state already has a toll bridge authority, ENR March 5, p.26) to finance and construct the cross-state highway. It stipulates, however, that the proposed authority could join in the interstate plan only "upon formal proclamation by the governor that such a project is feasible and it's necessary to avert loss of tourist traffic."

A commission of state highway officials, representing Indiana, Kentucky, Tennessee, Georgia and Florida, is now studying the proposed plan for integrating planned and future toll road projects in each state.

Plans for three proposed major dams in Idaho outlined by Army Engineers

The Army Engineers revealed plans for construction of three large power dams in north central Idaho last week at a hearing in Orofino, Idaho. Col. Fremont S. Tandy, Walla Walla district engineer, said the corps will include the three dams in a revised report on project surveys to be forwarded to Congress on Dec. 22.

The projects are:

• **Bruce's Eddy,** on the north fork of the Clearwater River, 1½ mi north of Ahsahka, traditional starting point for Clearwater log drives. The dam would cost $125 million, produce 244,000 kw and store 1,430,000 acre ft.

• **Penny Cliffs,** on the middle fork of the Clearwater, 3 mi above Kooskia, Idaho. It would cost $180 million, produce 292,000 kw and store 2,300,000 acre ft.

• **Mountain Sheep,** on the Snake River above its juction with the Imnaha, costing $358 million, producing 1,035,000 kw and storing 2,450,000 acre ft. But Col. Tandy explained the Mountain Sheep plans are, to some degree, contingent on the final disposition of the Hell's Canyon high vs. low dam controversy now before the Federal Power Commission (ENR July 23, p. 21; July 30, p. 21; Aug 6, p. 23).

More than 400 persons jammed Orofino's Veterans of Foreign Wars auditorium for the hearing, which brought only one solid protest against the river proposals. That was from the Idaho State Fish & Game Department which testified that the Clearwater dams would deplete the state's deer and elk population by flooding winter rangeland and might destroy salmon and steelhead runs in the Clearwater watershed.

• **Projects get wide support**—A number of communities submitted resolutions suporting the programs both for the Snake and Clearwater Rivers. These included the commissioners of Clearwater and Idaho Counties; the cities of Lewiston, Orofino, Grangeville, Kamiah, Kooskia, Elk River and Pierce; and chambers of commerce of Spokane, Moscow, Orofino, Grangeville, Lewiston, Riggins, Kooskia and Kamiah.

Col. Tandy pointed out that the Clearwater dams would contribute to flood control on the Columbia as far as Portland. "If we had these two Clearwater dams in 1948," he asserted, "they would have lowered the flood waters at Vanport 2 ft."

He told the hearing that the "cost ratio of the Clearwater dams would compare favorably with any projects in the Columbia system." Benefits from Bruce's Eddy would aggregate $10,450,000 yearly, a benefit cost ratio of 1.921 to one. Annual benefits from Penny Cliffs would amount to $13,428,000, a ratio of 1.7 to one.

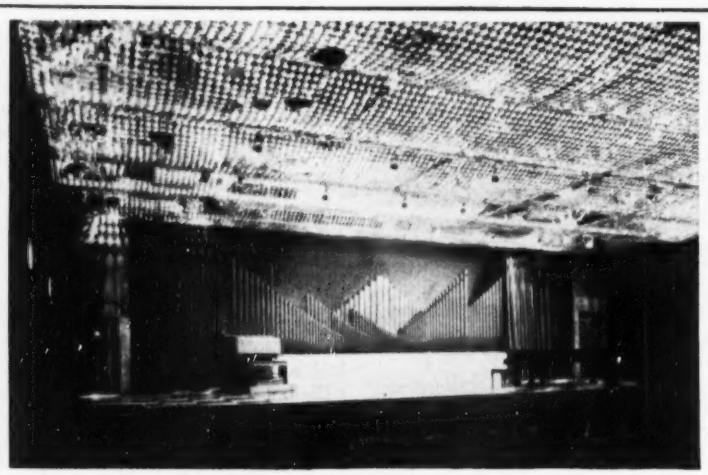
The Clearwater projects would be built by the corps and the Mountain Sheep Dam by the Bureau of Reclamation. Col. Tandy's comments on Mountain Sheep figures gave rise to some speculation that it might be the alternate federal dam to be proposed in January.

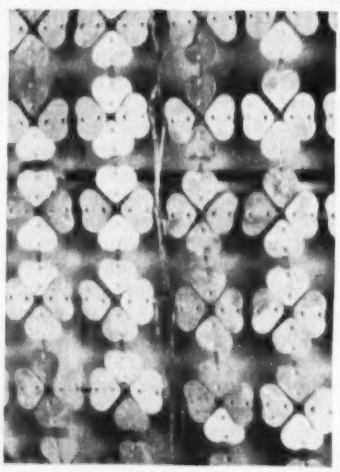
• **Alternate to Hell's Canyon**—A. L. Nelson, Boise, planning engineer for the bureau, outlined the first comprehensive study of Mountain Sheep. Contingent on the Hell's Canyon project, the bureau plans a 565-ft high concrete dam, with expected annual benefits of $28 million and a benefit ratio of 1.58 to one.

Mountain Sheep, Engineer and bureau spokesman made clear, was expected to be a federal project. But Col. Tandy commented that the Clearwater dams are of a size and type that could be built either by public or private utilities. Production from the Clearwater sites could be expected, he forecast, within three years after construction began.

Col. Tandy has informed Senator Dworshak of Idaho that the corps will submit in January a plan for a large multi-purpose dam on the Snake River system as a possible alternative to Hell's Canyon, where the Idaho Power Co. would like to build three dams but where public power advocates want the federal government to build a single high dam. The Kooskia site on the Clearwater, with a hydroelectric potential of 440,000 kw, and the Nezperce location on the Snake, with a potential of 1,650,000 kw, are other possibilities.

The state of Idaho approves Corps of Engineer plans for dams in north central Idaho but wants assurance of some electric power, according to statements by two state officials following the hearing.





"Fish-net" ceiling

Unusual acoustic and illuminating effects are achieved with a very low weight "fish-net" acoustical suspended ceiling in the concert hall of the new Fine Arts Center at the University of Arkansas, Fayetteville. The net is composed of many thousands of small heart-shaped sheet-aluminum stampings mounted at a variety of angles. The designers say this will result in highly effective sound absorption and elimination of reverberations. In addition, novel lighting effects are produced by having lighting fixtures above the net. Ceiling, including net supports, weighs only about 1 psf. Designers are architects Edward D. Stone and Haroldson & Mott of New York City.

L. F. Harza dies;

Leading US consultant on hydro power plants won international fame

Leroy Francis Harza, internationally famous as a consulting engineer on dams and hydroelectric power plants, died Nov. 22 in Chicago at the age of 71. Active in his profession almost to the day of his death, his consulting engineer career of nearly half a century had made him the dean of American hydraulic engineers.

Many of the world's notable hydropower installations were the products of his seasoned judgment and originality of thought, and it is interesting to recall that it was his design for the Barnhart Island powerhouse of the St Lawrence River project—36 units of 55,000 kw each—made in 1942—that was used as the basis of the application of the New York State Power Authority to the Federal Power Commission for a license to build this great project.

Mr. Harza had headed his present consulting firm in Chicago since 1920, but his actual practice had started in 1906, when for a period of 6 years he was chief designer for Daniel W. Mead, famous hydraulic consultant of Madison, Wis. During 1912-16, Mr. Harza had his own consulting office in Portland, Ore., which did much of the pioneer work on such currently important projects as The Dalles and Bonneville dams and power plants on the Columbia River. From 1916 to 1920, Mr. Harza was engaged in the design of hydroelectric plants for the Great Lakes Power Co. of Sault Ste. Marie, Ont.

From Mr. Harza's Chicago office have come the designs for such other significant projects as the Dix River Dam in Kentucky, the Loup River plants in Nebraska, the Santee-Cooper Dam and powerhouse in South Carolina, the power installations at Fort Peck, Norfolk and Bluestone Dams and the Rio Negro development in Uruguay.

His firm is at present consulting and supervising engineer on the Maithon Dam of India's Damodar Valley Authority, and until last year Mr. Harza had served as head of the three-man consulting board to the authority on the development of its TVA-like program of eight dams and other facilities for this important Indian river. During this period Mr. Harza spent one month out of every four in India. His last accomplishment was the design of Ambuklao Dam in the Philippines, the world's highest rockfill, which is now under construction. (ENR April 16, 1943 p. 43).

Leroy F. Harza

Mr. Harza was born in Brookings, S. D., and received a degree in mechanical engineering from South Dakota State College in 1901. After teaching mathematics for two years at Michigan State College he entered the University of Wisconsin, receiving a BS in civil engineering in 1906, and his professional civil engineering degree in 1908. Mr. Harza's firm, the Harza Engineering Co., will be carried on by his associates Calvin V. Davis, E. Montford Fucik and Richard D. Harza, his son.

Chief engineer named for Wisconsin turnpike

As a move to get its $250,000 toll road study under way, the Wisconsin Turnpike Commission has named Otto C. Rollman, veteran consulting engineer, to the post of chief engineer and administrative officer.

The study—authorized by the 1953 legislature—will determine the feasibility of a $170-million toll road across Wisconsin from Illinois to Minnesota, roughly following U. S. Route 12 (ENR Nov. 5, p. 25).

Rollman, head of the Green Bay, Wis., consulting engineering firm of O. C. Rollman & Son, was at one time a division engineer for the Wisconsin State Highway Commission.

Late this month the commission is expected to hire two private firms to begin the study of revenue and traffic estimates, and engineering and construction costs. If—on the basis of this survey information—the road project seems practicable, the commission can set itself up as turnpike corporation, issue bonds and start construction.

NSPE declines bid

Engineers Joint Council affiliation is rejected by a 69 to 12 vote

The National Society of Professional Engineers has declined the invitation extended to it late last year to become a member of Engineers Joint Council. NSPE was one of eight engineering organizations asked to join when a decision was made to expand the activities of EJC (ENR Feb. 21, 1952, p. 27).

This decision not to participate in the activities of EJC at the top level was reached at the fall meeting of the Board of Directors of NSPE held in Indianapolis recently. The vote was 69 to 12. For some years, NSPE has participated in some of the committee work of EJC, notably on labor law.

In declining the inviation, the board expressed the belief that "effective professional action could be accomplished only through an integrated three-level organization composed of individual members." EJC is made up of representatives from the officers of the constituent societies.

Despite this refusal to participate directly in EJC, the NSPE board urged its officers, committees, and state and local organizations "to extend the fullest degree of cooperation to EJC and other engineering associations in programs for the betterment of the profession in which mutual interest exists."

Invitations also were issued to the American Association of Engineers, American Society for Engineering Education, American Society of Heating and Ventilating Engineers, American Water Works Association, Institute of the Aeronautical Sciences, Institute of Radio Engineers and the Society of Naval Architects. Of these, the ASEE, AWWA and SNA have accepted; IRE and NSPE declined.

Before the bylaws of EJC were revised to permit this expansion, EJC was made up of representatives of the five major engineering societies: ASCE, AIME, ASME, AIEE and AICHE.

Other action taken by the NSPE board included authorization of construction of a headquarters building in Washington, approval of the dates of Feb. 21-27, 1954, for engineers week, stepping up the society's public relations program, continued efforts to combat the spread of collective bargaining among professional engineers, and an expanded professional-development program for young engineers.

The NSPE spring meeting is to be held Feb. 19-20 at Albuquerque, N. M.

Windowless plant for making electrodes has air conditioned, sealed interior

Sealed against the intrusion of dirt from the outside air, the 41,000-sq ft interior of the A. O. Smith Corp.'s $1-million Eastern Welding Electrode plant, near Lancaster, Pa., provides laboratory conditions for the mass production of welding electrodes.

To attain the laboratory conditions required for production, an air conditioning system was installed which not only extracts dust and dirt from outside air drawn into the building, but takes dirt from the air it exhausts to avoid further contamination of the outside air.

The system also keeps air pressure inside the plant higher than that outside the building by drawing in more air than it lets out. This air pressure differential allows air-borne dirt to seep out of the building rather than into it.

Insulated storage for chemicals in the plant is maintained at a constant temperature and humidity to insure completely controlled mixes of the electrode coatings.

The plant is cleaned at least once daily by vacuum cleaner. Interior walls of the plant are finished in glazed tile to cut down cleaning. The brick and cast stone exterior requires no paint, thereby eliminating exterior maintenance work.

The plant was designed by the General Service Division of A. O. Smith, Milwaukee, Wis., and the general contractor was D. S. Warfel Associates, Inc., of Lancaster, Pa.

Firm held not liable for bulldozer rampage

The owners of a bulldozer that roared on a driverless rampage through Mission Valley on the night of July 7, 1952 after being started by pranksters are not responsible for the havoc left in the huge machine's wake.

That was the verdict of a jury in California, which ruled against seven victims of the bulldozer's relentless force. The victims had asked a total of $203,522 in damages. The Ham Brothers Construction Co. was the principal defendant in the case. The youths who started the bulldozer and turned it loose as a prank were also named as defendants in the suit as a legal formality.

The victims sought to pin responsibility on the construction company by maintaining that the tractor had been left unlocked. One of the pranksters, Donald Paul Hamm, 19, testified it was not locked. But the contractors asserted that it had been locked for the night. Hamm and Rollie Eugene Fugate, Jr., 21, served a jail term for simple assault as a result of their prank.

Principal plaintiffs were James Richardson and his wife, seeking $187,200. Both were injured when the bulldozer rumbled through their home. Richardson lost his left arm. The bulldozer also damaged two other homes, a building, two autos and a trailer.

The runaway was finally stopped when it ran up a utility pole guy cable and lifted itself partly off the ground. One track dug into the ground until a passerby jumped on the juggernaut and stopped it.

Pollution control standards adopted

The North Carolina State Stream Sanitation Committee has adopted standards it will use for a projected pollution control program. Standards call for six different classifications of fresh water and four of salt water (ENR July 23, p. 25).

In adopting the standards, the committee approved a number of changes proposed during a series of hearings in the summer.

The standards are to be applied to various portions of North Carolina's streams as surveys are completed. A survey of the Yadkin River is nearly complete and the committee is working on the White Oak, Chowan and Roanoke Rivers. The Cape Fear basin will be surveyed next.

Following surveys of the rivers, the committee will fix standards for various portions of the streams after conducting hearings. It hopes to begin the hearings along the Yadkin in February.

Simplified panel system devised for house walls

A simplified panel system for exterior walls of houses will be presented at the University of Illinois' Small Homes Council's annual session on residential construction, Jan. 20-21.

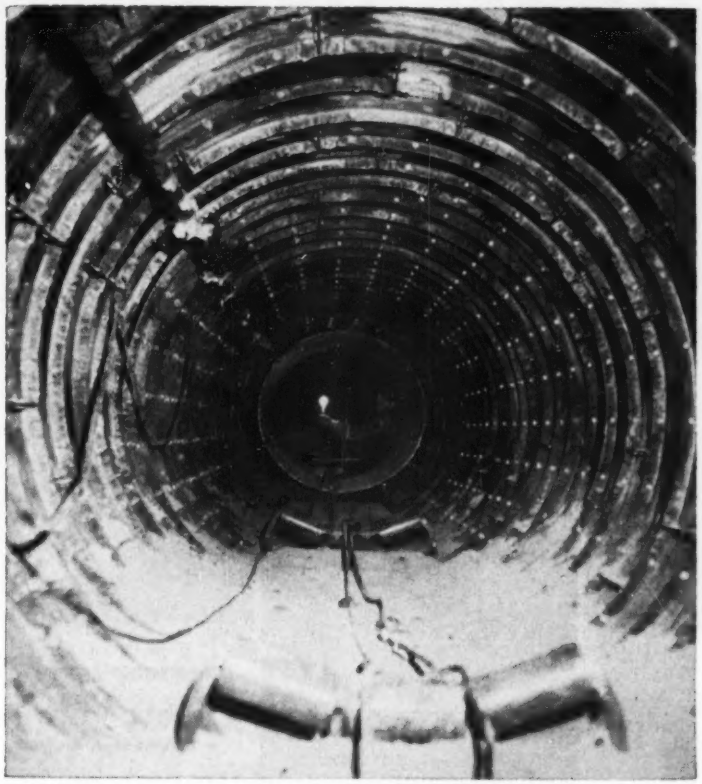
The panels—developed as part of a construction study sponsored by the Lumber Dealers Research Council—can be assembled in the yards of builders or materials dealers, then trucked to the site along with pre-assembled roof trusses. They are so designed (four ft wide and of wall height) that windows can be incorporated prior to shipping.

A second program highlight will be a discussion of the post-and-beam method of house framing. Other scheduled topics include construction and design of windows, radiant heating research and air-conditioning.

Registrations (fee: $12.50) for the two-day course are being accepted by the Division of University Extension. Additional information may be obtained from R. K. Newton, Supervisor of Engineering Extension, 713½ S. Wright St., Champaign, Ill.

Army plans arsenal expansion in Virginia

The Army arsenal near Radford, Va., will undergo a $6.4-million expansion under the direction of the Corps of Engineers Norfolk district office. A $135,000 contract for plans and specifications has been awarded to Haves, Seay, Mattern and Mattern, architect-engineer firm of Norfolk and Roanoke, Va.



Rollers used to place pipe in tunnel

Conveyor-belt rollers were used to push a 48-in. water main through an 80-in. tunnel in Omaha. The pipe will be the main service line in the Metropolitan Utilities District's million-dollar, underground Field Club Reservoir (ENR Sept. 24, p. 45).

Kenneth Young, general superintendent of construction for MUD, devised the roller technique because of difficulties foreseen in usual procedure of concreting the bottom of the steel-lined tunnel and jacking the main in on skids. There was the threat of damaging bituminous coating on the pipe. And, alignment would have been difficult to maintain in the 150-ft tunnel, and even harder to correct.

The rollers were decided upon after tests in which they successfully withstood having sections of pipe dropped upon them.

The rollers were set on 15-ft centers. The pipe came in 20-ft sections. A section was run into the open end of the blind tunnel. Another section was welded to the butt. The complete portion then was pulled in and the operation repeated.

Pipe was pulled forward by a dragline pulling a cable attached to blocks at the blind end of the tunnel. Actually, a pickup truck could have supplied all the necessary power. Each took only a couple of minutes. The alternative of using hydraulic jacks would have required a half day's time per section, Mr. Young said.

Tin fixed on the bottom of the pipe safeguards the coating from damage. Because the rollers are of comparatively low cost, they are being left in place as supports for the pipe.

Grout has been placed half way up the side of the tunnel. It was permitted to flow in slowly enough to avoid causing the pipe to float up. Pipe was blocked in place but this precaution proved unnecessary. Next spring, when weather moderates, mud will be jacked through holes left in liner roof to complete job of sealing pipe in place.

The pipe is part of a 2,000-ft line that leads from the reservoir to a pumping station. The two-way line will carry water pumped into the reservoir and serve as a supply line for water from the tank.

News briefs . . .

• **Design entries due**—The Architectural League of New York will hold its 1954 National Gold Medal Exhibition Feb 23 through March 27 to honor outstanding work in architecture and allied fields. Engineering work—to be eligible for an award—must demonstrate some visual aspect of building (structural, mechanical or electrical) and make a special or unusual design contribution to the progressive development of structures. Preliminary submissions to the show—consisting of photographs only—can be made until Dec. 31. A circular may be obtained from engineering committee chairman Peter A. Strobel, 70 West 40th St., New York 18, N. Y.

• **School construction aid**—Indiana school construction will be stimulated by new funds to be made available to local school districts by the State Common School Fund Building Commission, which was created by this year's legislature to aid communities that have exhausted their taxing and bonding power. The commission plans to dispose of $22 million in federal government securities and use the proceeds to purchase school district bonds, as applications for new buildings are approved. Officials say this method of financing will bring more money into the fund because of the higher interest rates on the school bonds.

• **Signs of the times**—The Virginia Department of Highways is switching from metal to plastic route-number signs as a means of saving money and repair time. Its initial order: 10,000 at $3.05 each (compared with $3.20 for metal ones). When a plastic sign is damaged, workmen can repair it right on the spot. The damaged portion is cut out; a new disc, taken from a plastic blank, is inserted.

• **Alaskan hydro project**—The Bureau of Reclamation has completed exploratory drilling at the site of a proposed concrete hydroelectric dam (160 ft high) on Blue Lake near Sitka, Alaska. The dam—with generating capacity of 11,000 kw and annual firm output of 60 million kwh—is being considered as a power source for a projected lakeshore pulp mill. It would impound 90,000 acre-ft of water, which would be conducted 6,600 ft downstream to a power plant at tidewater.

• **Canadian plant started**—H. K. Ferguson Co., Ltd., Canada, has started work on a $20-million synthetic fiber plant for Imperial Chemical Industries, Ltd., at Millhaven, Ont. The plant consists of 10 buildings (total floor space 551,000 sq ft).

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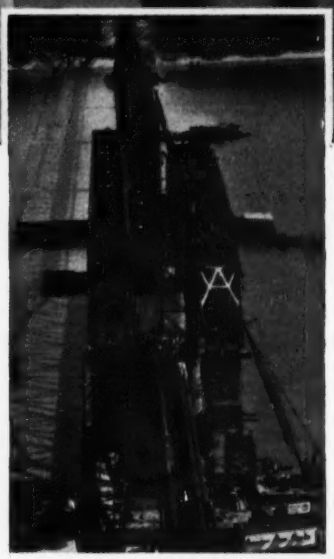

AMERICAN BRIDGE uses unique method in replacing 61-year old structure on Illinois Central's busy main line

ONE of the most interesting modernization jobs in recent years is the new superstructure for Illinois Central's busy main line bridge over the Ohio River at Cairo, Illinois.

To accommodate today's heavier, faster traffic, this important railroad replaced its 61-year old nine-span structure with 12 modern spans.

American Bridge, because of its skill, know-how and wide experience, was the logical choice to perform the major construction feat of building the new superstructure on the original piers with a minimum interruption in traffic.

The first old span of the bridge was rolled off its piers onto temporary falsework and the new 518-foot, 1,700-ton span moved into position and opened to service after a traffic interruption of only 20 hours. The old span was launched like a ship into the river 100 feet below for easy removal. The same procedure was followed span by span until the entire bridge was completed.

While this is the first time this method has been used on a job of such magnitude, it is a typical example of the part American Bridge is constantly playing to help our vital railroad systems meet the needs of growing America.

INTERESTING FACTS

- 6 deck-truss spans, 197' 7"
- 4 thru-truss spans, 400' 11½"
- 2 thru-truss spans, 518' 11"
- Bridge is single track.
- Steel used, 10,000 tons.
- Erecting procedure: Illinois Central R. R. and American Bridge
- Consulting Engineers: Modjeski and Masters.

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ENR photos by Compton

Powder tools winning fight for acceptance

Powder-actuated tools, dubiously regarded by many building unions and some contractors only a few years ago, have eased themselves into the construction industry. And it looks as if they're in to stay.

The fight for acceptance—mostly against opposition by labor and the public—has been tough. Most of it has centered around safety in the design and operation but there is little doubt that many building tradesmen were inclined to classify the tools as speed-up devices.

• **Early troubles**—Powder-driven fasteners are hardly out of their infancy, but they've gained tremendously in acceptance—especially on the West Coast—since their introduction to the construction market half a dozen years ago.

Early models did not incorporate many of the safety features which characterize today's tools.

But, three or four years ago, manufacturers of the tools began a full-scale campaign to woo labor. Tools were redesigned; old ones were called in; manufacturers sat down with labor and state officials in many states and drafted codes covering sale and operation of the tools.

But opposition—minimized to be sure—still exists, especially in the East, and manufacturers admit sales—which show the expansion of a young industry—still aren't what they could be.

• **Weapons or tools?**—The biggest makers of powder-driven tools, two of whom are also in the small arms business, are gunshy about the tendency to over-dramatize the need for safety features on their product. They shudder whenever a powder-driven fastener is referred to as a "gun."

They add that accident records—admittedly incomplete and inconclusive—do not show powder tools to be less safe than, other tools—say, hand tools or power saws. Powder Actuated Tool Manufacturers Institute (PATMI) a group supported by three manufacturers to promote use of the tools, is working now on an accident reporting form to permit analysis of each mishap involving powder tools.

Techniques for survival: Powder actuated tools

- Study the job—note type, thickness and general condition of material. Don't drive studs into unknown material.
- Use care in selecting proper stud and cartridge.
- Don't fire into wood, plaster or other soft materials unless they are backed by hard substances. If necessary, place sandbags or timbers directly behind work.
- Don't fire into extremely hard or brittle substances.
- Set fasteners far enough (6 in.) from edge or corner of bricks, concrete, masonry or wood surfaces so material won't break off or crack.
- Keep surfaces clear of all particles that might fly off.
- Make certain no one is directly behind working area or in line of fire. Keep bystanders at a distance.
- Hold tool at right angles to the work surface and firmly against it.
- Keep fingers and hands away from the front of the barrel. Use work gloves.
- Be sure tool is unloaded except when in actual use. Don't point tool toward anyone.
- In case of misfire, hold tool in operating position for one minute—then place in vertical position (muzzle down) and remove shell.
- Store tools, studs, cartridges in a safe place—preferably under lock and key.
- Transport tools in locked containers.
- Clean and oil tools at intervals determined by use.

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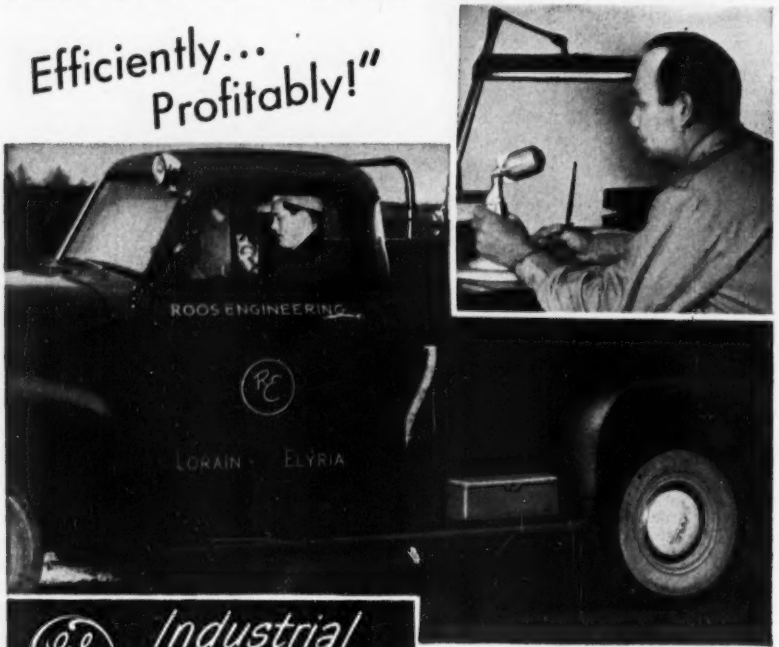

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Workmen who use today's tools seem to like them. They show little fear, and handle them as though they trust the safety features. Loudest insistence that the tools are unsafe comes from officials of building trades locals, and even though nobody will come right out and say so, talk of safety probably camouflages anxiety that powder fasteners will mean less manhours of work on jobs where they are used.

• **The codes**—Many states have worked out codes covering the safe use of powder tools. The best codes probably are those in California, Oregon and Washington, and the one now under study in New York promises to be as good.

In California, powder-actuated tools came into general use in 1949. After three fatalities labor, manufacturers and the Industrial Safety Division drew up a pioneer code, spelling out safety requirements, training procedures and conditions under which tools may be used. Injuries have decreased steadily since adoption of the code, despite a boom in the sale and use of powder-driven tools.

A strict code was adopted in Washington about eight months ago, after heavy opposition by labor. In Oregon, where powder-driven tools have been used since 1946, labor conducted a bitter campaign, first to outlaw the tools and later to obtain stiff regulations. A series of accidents was used to point up labor's charge that the tools were unsafe. There have been no injuries attributed to the tools in Oregon since adoption of a state code in 1952. The code—one of the stiffest in the country—calls for a report to the state within three days of the name of any buyer of a powder-driven tool.

Opposition to the tools in the Midwest—at first strong and widespread—has become spotty. Labor is accepting cartridge tools, and their use has become widespread among general contractors and specialty contractors—electricians, plumbers and ventilating and air-conditioning contractors.

In New York—as in much of the Northeast—there is fairly effective opposition by building trades officers. An exception is New York City's electrical workers union, which a year ago went along with adoption of the tools by a joint labor-management group. Harry Van Arsdale, Jr., business manager of big Local 3 of the electrical workers in New York, said, "The problem in the electrical construction industry . . . is to make labor and management just as productive as is

compatible with safety and good results. The use of powder-actuated tools also means that our older workers can keep up."

In general, the International Brotherhood of Electrical Workers, like most construction unions, has no national policy on powder-driven tools. It's pretty much up to the locals, and rules—unwritten or otherwise—barring members from using the tools, are found mostly in areas where there have been serious accidents from their use.

• **Just another tool**—There's been talk of the possibility of setting up a separate union of highly trained specialists to handle powder-driven tools, but nobody takes it seriously. Operation of the tools today is neither complicated nor inherently unsafe, both manufacturers and workers agree, and most tradesmen who accept the tools see them as simply another implement of their trade.

Unless otherwise specified by state code, training in using the tools is handled informally within construction locals. A few members are trained by manufacturers, and they in turn pass on their knowledge to other tradesmen.

Biggest hazards of cartridge-powered tools are: accidental discharge, ricochet of fasteners, use in explosive atmosphere, complete penetration by projectiles and flying particles. Most tools on the market today have safety features to minimize these hazards, and manufacturers are working to perfect safer tools. Some indication of the growing acceptance of the tools can be seen in the observation that last year nearly 40,000,000 fasteners were driven by more than 30,000 cartridge-powered tools.

Academic probability

Even if the Department of Labor's recent indication that it'll push for a higher minimum wage level is followed through, it will have little direct effect on the construction industry. Building trades workers already are getting more than three times the minimum prescribed by law.

The law now sets up 75 cents an hour minimum wage plus time and a half for anything over 40 hours a week. But the average hourly October rate for union construction trades workers was $2.71, and the hourly September earnings for both union and non-union workers averaged $2.44 (including overtime).

Travel pay

Mileage rate is a new wrinkle now under study

A committee of labor, management and government is trying to determine whether thousands of workers at a half-billion-dollar addition to the Oak Ridge, Tenn., atomic energy plant should get mileage pay of 7 cents a mile to and from work.

Work was resumed on one of the construction projects at the plant a week ago after a strike of three weeks' length, begun Nov. 2 by 550 sheet metal workers and joined a week later by 6,000 other American Federation of Labor building tradesmen who honored the sheet metal workers' picket lines.

The sheet metal workers had struck in support of their demand for travel allowance from their homes to the job and back home again. The union's request was one of the first for travel pay at a mileage rate for construction workers. Travel pay as such is not unusual on big atomic projects, but usually it has taken the form of a flat daily sum.

• **Orders from the top**—The return to work at Oak Ridge was ordered by the AFL Building Trades Department in Washington while the committee was named to look into the sheet metal workers' travel pay request. The committee is made up representatives of the union, the contractor and the Atomic Energy Commission.

The project on which the men are working is an addition to the gaseous diffusion plant for production of fissionable uranium 235. Any travel pay payment, under the cost-plus contract under which the work is done, would be passed along to the government.

The workers earlier had rejected an offer by Maxon Construction Co; prime contractor on the job, of $1.50 a day, which the company said is the same as the round-trip bus fare from the job to the Knoxville city limits.

Maxon said the seven-cent demand would amount to $3.92 a day for each worker. The sheet metal workers now get $2.65 an hour. Many of them live in Knoxville and other surrounding communities in the eastern part of Tennessee.

The walkout was the second general construction strike on the project since construction began in August 1952. An area construction strike last May closed down the project for two weeks.

Typical application — Le Roi engine on Barber-Greene paver.

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World's tallest dam rises in Switzerland

Waldo G. Bowman
Editor, Engineering News-Record

Photos by author

IN THIS HOLE being excavated in front of the existing Little Dixence Dam in the Alps of southern Switzerland the Grand Dixence Dam will soon begin to take form from the output of this . . .

. . . HIGH LEVEL CONCRETE PLANT whose six 3-cu-yd mixers (in building at right) are served by a teleferique (center) that brings cement 11 miles and lifts it nearly 6,000 ft. from railhead to damsite.

Concreting began last summer in southwest Switzerland on a power dam destined to be the tallest in the world. At 1½ miles above sea level in the Alps, Swiss engineers and contractors, working for a private Swiss power company (Grande Dixence S.A.) are fashioning a straight gravity-section dam that will be nearly 200 ft taller than Hoover Dam and nearly three times as large in concrete volume. Known as Grand Dixence Dam, its tremendous size is a result of a planned height of 922 ft from foundation to crest and a mass of 7,540,000 cu yd.

And as if one record-breaking dam were not enough, another Swiss power company is concurrently building Mauvoisin Dam, in an immediately adjacent valley, to a height of 777 ft above the foundations, or 51 ft higher than Hoover. Mauvoisin, however, will contain only 2,528,000 cu yd of concrete as compared with Hoover's 3,000,000.

The two projects, Grand Dixence and Mauvoisin, are quite separate and distinct, although both draw on some of the same watersheds (at different elevations) and both have one of their power plants at the village of Fionnay.

The Grand Dixence is actually an expansion of an existing installation completed in the early '30's involving a 285-ft dam of unique hollow gravity-section (some 1,300 ft upstream, it will be drowned out by the new high dam) and a 150,000-kw power plant 11 miles down the mountain in the town of Sion on the Rhone River. Known as the Chandoline power plant, it is one of the most important in Switzerland, and in addition is of wide technical interest because its gross operating head of 5,740 ft is the highest in the world and because its penstocks were among the first to use welded joints. Construction of the new Dixence Dam will not at any time interrupt the operation of the Chandoline plant.

• **Under way 2 years**—The Grand Dixence project has been under way since 1951, two years having been required to open an access road to the site and to assemble the extensive and large construction plant that will be needed. The magnitude of the road-building task is highlighted by the fact that there are 32 switch-backs or hairpin turns required in the last 3 miles. The total length of road, from

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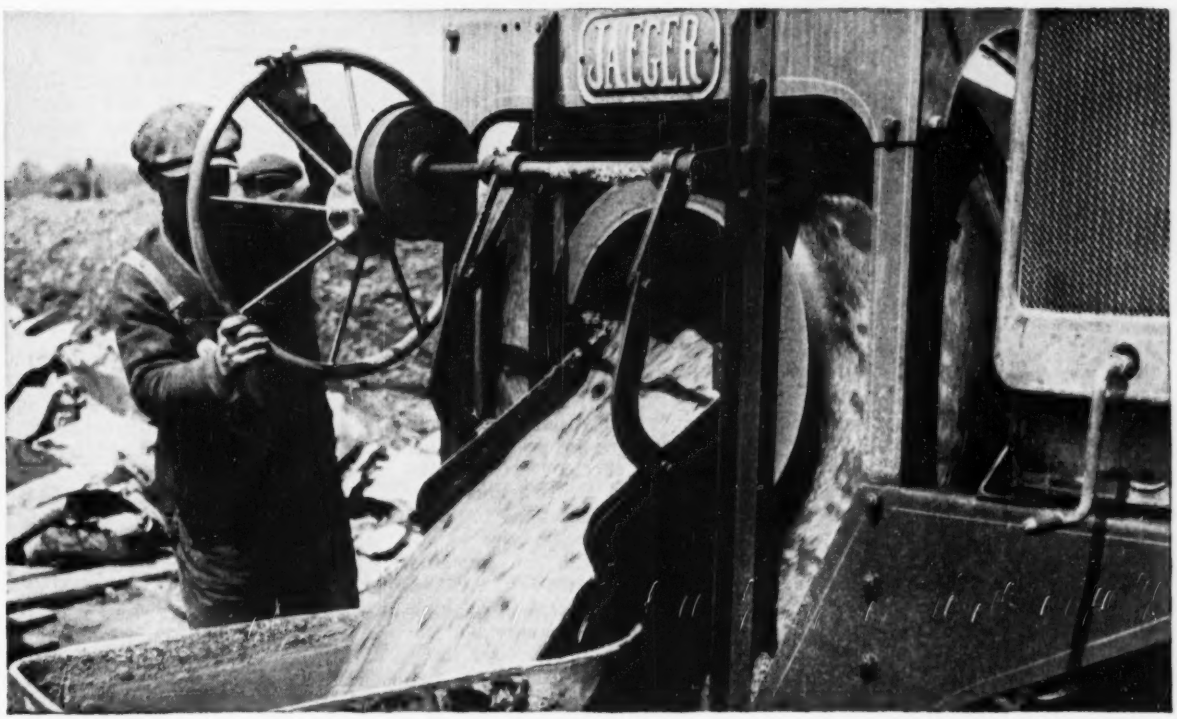

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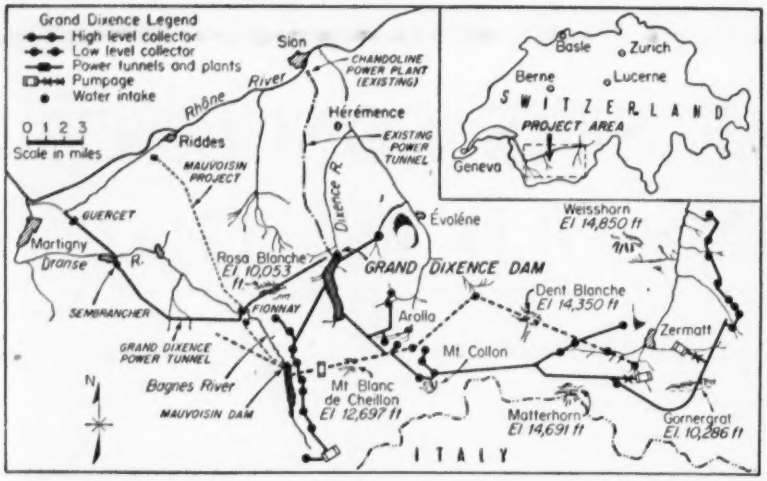

THE GRAND DIXENCE PROJECT is spread over the region of high Alpine peaks dominated by the famous Matterhorn and dropping to the Rhone River valley. Its water collection facilities coordinate with those of the neighboring Mauvoisin project.

the railhead at the town of Sion on the Rhone River to the dam site, is 18½ miles. The straight line distance from Sion is 11 miles, and this is the length of the teleferique (tower-supported endless cable transporter) over which the cement is brought to the dam at its 6,000-ft higher elevation. Another big preparatory job was the driving of a mile-long tunnel into an adjacent valley to reach a suitable supply of concrete aggregates. These tasks, plus the installation of crushers, mixers and cableways and a large share of the necessary excavation for the dam are completed, and the long job of concreting is just beginning.

Grand Dixence Dam will be built in three stages. The first stage, planned to be completed in 1956, will carry the dam to a 584-ft height and require the placing of 2,352,000 cu yd of concrete. The second stage, scheduled for completion in 1959, will raise the dam to 667 ft. The final phase, which it is planned to finish by 1966, will give the dam its ultimate 922 ft height. In the meantime, tunnels will be extended farther and farther into the mountain valleys to collect water, and farther and farther down toward the Rhone Valley to feed the power plants.

• **Water collected by tunnels**—The layout of the Grand Dixence power scheme involves two systems of water collection tunnels, as shown on the accompanying map, one to the east and one to the west of the reservoir and emptying into it at El 7,757 ft (the ultimate height of the dam). The eastern system taps two valleys—Arolla and Zermatt—which will furnish 209,000 ac ft of water annually, of which 133,000 ac ft flows into the collector tunnel by gravity while the remainder has to be pumped in. The total length of tunnel is 50 miles, and there are 21 water intakes on the system. Only the Arolla Valley section, with its 8 water intakes and 11.8 miles of tunnel, is included in the first stage.

The western system (14.3 miles of tunnel and 9 water intakes) taps the Bagnes Valley for 95,000 ac ft of water, of which about half reaches Grand Dixence reservoir by gravity while the other half must be pumped. This valley, however, is also the source of supply for the Mauvoisin project, so that at least an equivalent volume of water must be returned to it. This exchange is effected economically since the Grand Dixence must confine its water collection to high sources or resort to excessive pumping, while Mauvoisin can impound water from lower levels. Thus, Grand Dixence takes water from the high levels of the Bagnes Valley and returns water to the Mauvoisin reservoir from low level sources in the Arolla and Zermatt valleys to the east where only the high level waters are captured by the eastern collection system. This replacement-water tunnel, shown as a dashed line on the map, totals 20.5 miles in length and has 4 intake structures. A total of 120,000 ac ft of water will be delivered to Mauvoisin, collected entirely by gravity but lifted into its reservoir at El 6,260 by a pumping plant.

In addition a small amount of water (4,000 ac ft) will be supplied Grand Dixence by a 1.9-mile collector tunnel that discharges into the reservoir near the dam.

From these sources, Grand Dixence reservoir eventually will accumulate about 324,000 ac ft. (In the first stage construction, 40,000 ac ft will be accumulated in addition to the 40,000 ac ft now impounded by the existing dam.) Filled in the spring and early summer when the glaciers are melting, the reservoir will be used to generate power throughout the following fall and winter. Three power plants are included in the project, and in addition water will, of course, continue to be supplied to the existing Chandoline power plant at Sion. The actual division of water will be 1,600 cfs to the Dixence plants and 360 cfs to Chandoline.

• **Power to total 1 million hp**—As shown on the map, the three power plants will be located at Fionnay, Sembrancher and Guercet on a 17-mile tunnel running west and north from the dam to the Rhone River Valley near Martigny. The first stage of construction will include the 5.3-mile power tunnel down to Fionnay (15 ft diam bore and 13 ft diam lined), the penstocks (4,100 ft long and 10 ft diam) and the first of six 75,000-hp turbines in the underground Fionnay plant. These turbines will operate under a 2,860-ft maximum head and will discharge a total of 1,600 cu ft per sec into a 210-ac ft compensating reservoir in the bed of the Dranse River. From this reservoir the water will continue through tunnels and penstocks to the final two plants as follows:

Tunnel, Fionnay-Sembrancher, 13 ft diam, 7.9 miles long; two penstocks 6.6 and 7.2 ft in diam and 4,330 ft long; Sembrancher turbines, six at 65,000 hp under a 2,487-ft head; compensating reservoir of 160 ac ft.

Tunnel, Sembrancher-Guercet, 14-ft diam and 2.8 miles long; two penstocks 7.6 and 8.2 ft in diam and 1,360 ft long; Guercet turbines, four at 36,500 hp under an 870-ft head.

When all these facilities are completed, providing nearly 1 million hp of installed capacity, it is estimated that the Grand Dixence power project will add 1.67 billion kwh annually to the Swiss network.

• **Big dam, big construction plant**—Grand Dixence Dam will be a conventional full gravity section structure, following normal practices in both design and construction. Transverse contraction joints will be spaced 52 ft, and longitudinal joints a maximum of 132 ft. Foundations will be sunk into the solid granite of the mountains, but the major excavation task is in removing decomposed rock overburden. There is a total of 675,000 cu yd of this loose overburden involved, in addition to 273,000 cu yd of rock excavation.

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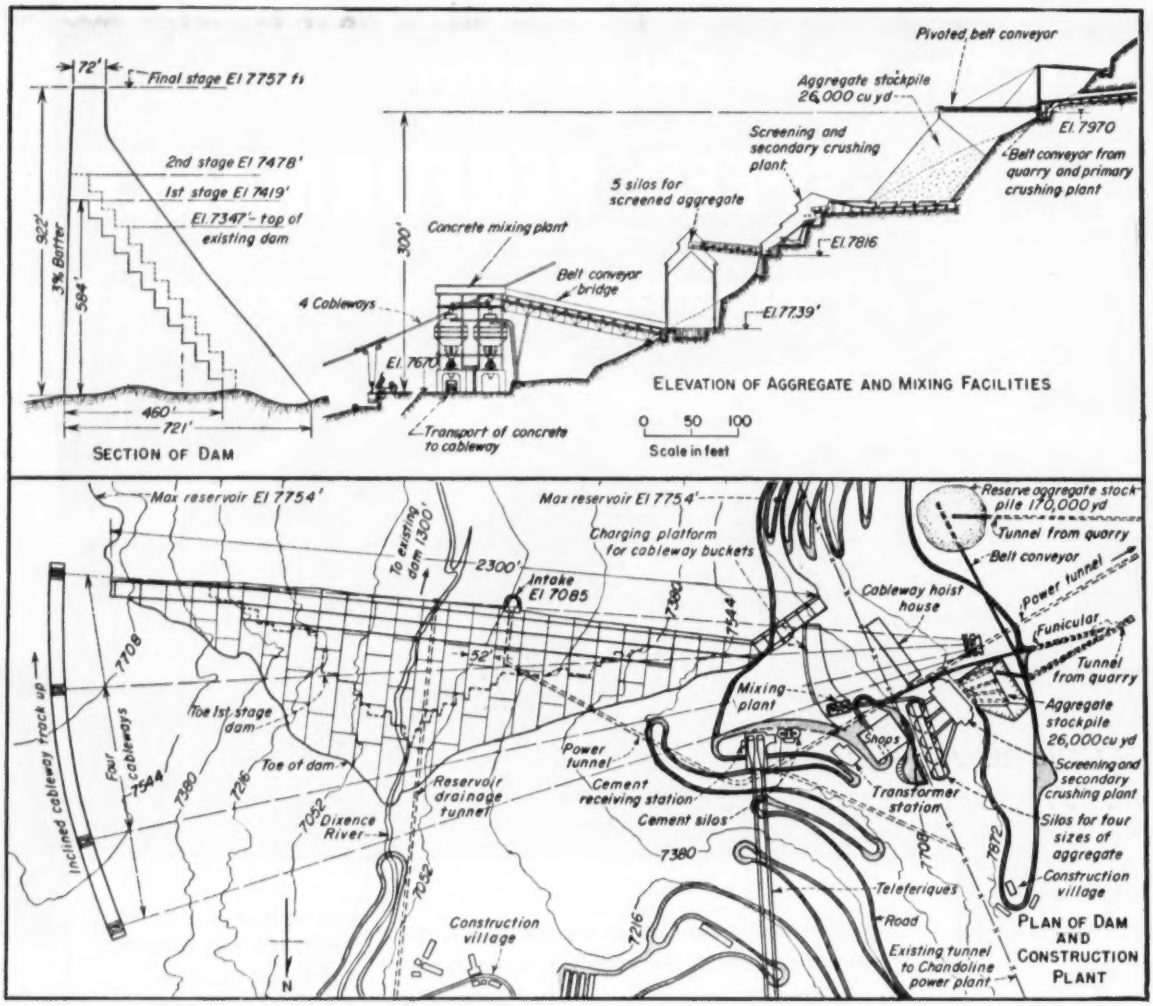


HUGE DAM REQUIRES comparably large construction plant to mix and place its 7,540,000 cu yd of concrete. The dam will be built in three stages on a schedule calling for its ultimate 922 ft height to be reached in 1966.

railway, has been under way for most of two working seasons, but principal present interest in the dam construction centers in the installation of the plant for the manufacture and placement of concrete. A few thousand yards of concrete was placed before the work had to be shut down this fall, but in the meantime the plant will be tuned up for capacity output when the job is opened up next spring. Major plant items cover aggregate supply and storage, the delivery and storage of cement, the concreting plant and the cableways for concrete placement.

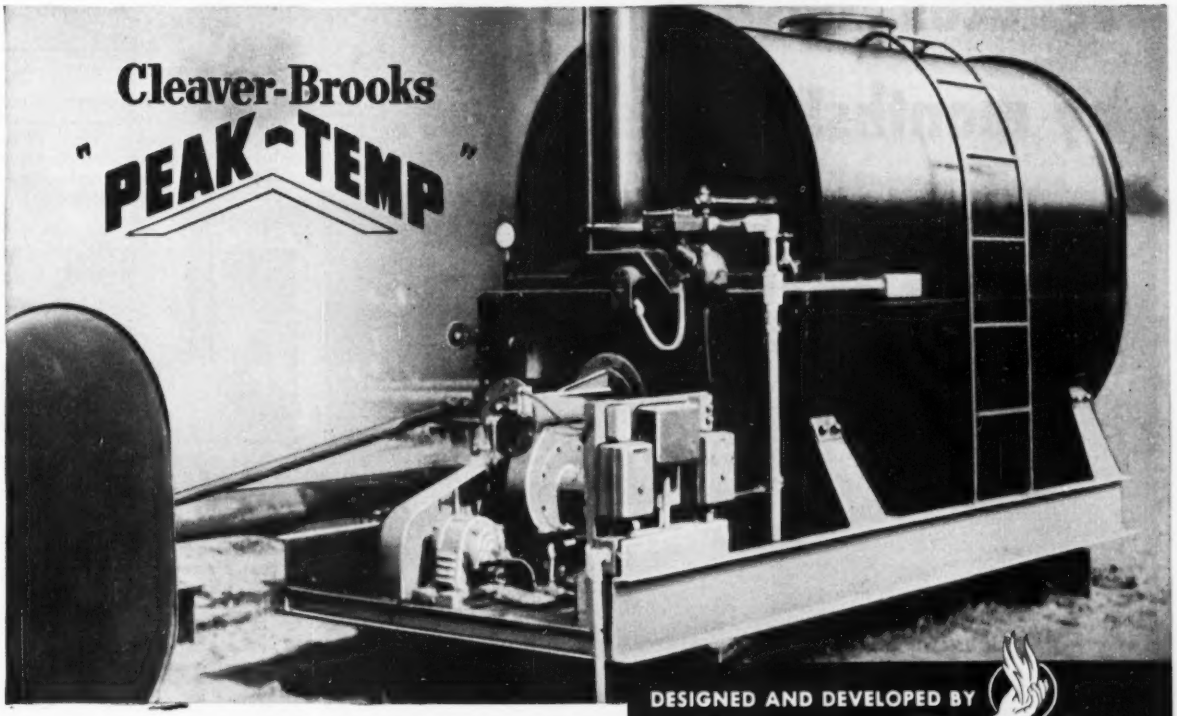
The equipment bill has been about $3 millic ı spread among suppliers in Switzerland, Italy, England and the United States. Familiar U. S. names —in some cases, however, on equipment manufactured in England—include Blaw-Knox, Bucyrus-Erie, International Harvester, Johnson, Kochring, Lima, Mack, and Fuller-Kinyon.

• **Aggregate supply** — No suitable sources of concrete aggregate existed in the valley where the dam is located, and particularly at a high enough elevation to permit a plant layout that could make maximum use of gravity flow of materials. The solution was to drive a mile-long high level tunnel into the next valley to the west where a good quarry site was available at El 8,500. Here was established the primary crushing plant and a complete construction village for 200 men to service it. And, since the site was otherwise inaccessible, the tunnel was made large enough to accommodate a 13-ton capacity funicular railway (to bring in equipment and supplies) as well as the belt conveyors used to transport the aggregates to the dam.

At the primary crushing plant all quarry rock that will pass through a platform made of bars spaced 24 in. apart is crushed to a 5-in. maximum size, the largest to be used in the concrete mix. All output of this primary crushing plant, which has a capacity of 525 cu yd an hour, is transported to the dam site through the tunnel on a 36-in. wide belt conveyor. There it is discharged onto the plant stockpile (capacity 26,000 cu yd) beneath which are four 100 ft long belt conveyors in tunnels leading to the screening, washing and secondary crushing plant. (In addition to this plant stockpile there is a reserve stockpile of 170,000 cu yd to which the aggregate can be diverted through a branch from the quarry tunnel. This reserve supply will be used in the early spring when the quarry site is still too deep in snow to be worked.)

Rock from the plant stockpile can be fed to the screening and secondary crushing plant at a rate of 525 cu yd per hr, to produce the four sizes of aggregate required: 0 to ¼ in.; ¼ to

NEW Oil Booster uses high-temp oil as heat transfer medium — eliminates water, steam and pressure problems



DESIGNED AND DEVELOPED BY

Cleaver-Brooks

Builders of Equipment for the Generation and Utilization of Heat — Pioneers and Originators of Self-Contained Boilers, Tank-Car Heaters, "Deuce" and Bituminous Boosters

...gives you higher temperatures, faster, with lower fuel costs, less maintenance

"Peak-Temp" is the newest, quickest, lowest-cost way of heating oils, bituminous and heavy viscous materials in tank cars, storage tanks, bulk plants and refineries. By using a specially selected high temperature oil as the heat transfer medium, "Peak-Temp" gives you advantages never before possible in bitumin heating equipment. Look at this speed, economy and versatility!

HEATS TWICE AS FAST AS STEAM— "Peak-Temp" increases the temperature of bituminous materials at the rate of 25° to 30°F per hour. This is approximately twice as fast as with 150 lbs. of steam. Unit operates with oil at temperatures up to 600°F, without special pumps and fittings.

COSTS LESS TO OPERATE— "Peak-Temp" gives considerably more heat than steam unit using the same amount of fuel. What's more, "Peak-Temp" operates at atmospheric pressures, thus eliminating need for licensed engineer. Oil evaporation rate is very low. Users report 50 gallons or less of new oil need be added to system each season.

ELIMINATES WATER AND WEATHER PROBLEMS — "Peak-Temp" eliminates need for water tanks, water pipes, etc. Requires no special foundation. Heavy-duty base, plus self-contained readiness for fuel, electric hookup, simplifies installation. Heat transfer oil has pour point of approx. 5°F, and will not freeze under normal early spring and late fall operations.

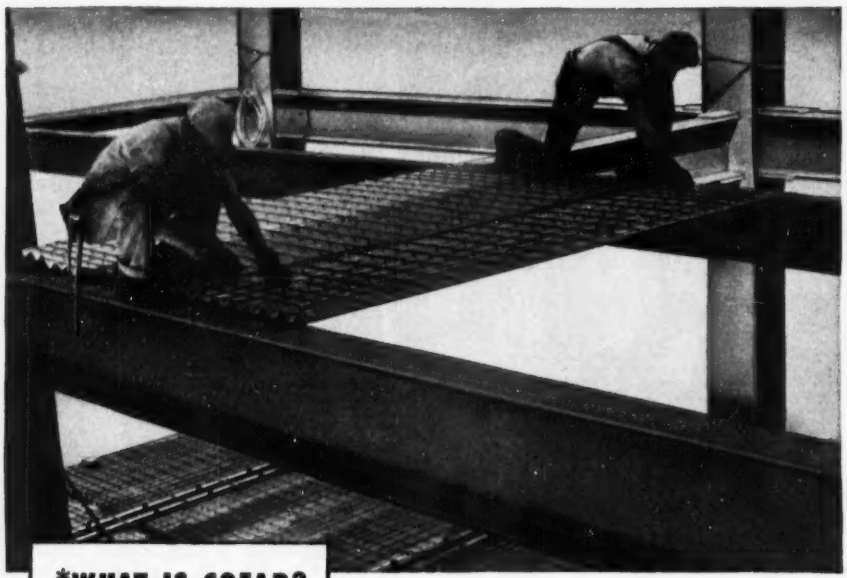
"Peak-Temp" can make your bituminous materials handling a top efficiency operation — even on toughest heavy-duty jobs. Write direct for full information — ask for bulletin AD-108.

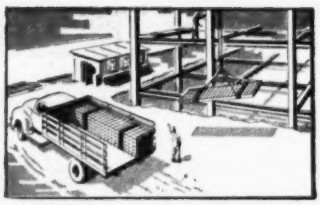
CLEAVER BROOKS COMPANY
Dept. P-393 E. Keefe Avenue, Milwaukee 12, Wisconsin.

Quick Facts on "PEAK-TEMP"

- **FULLY AUTOMATIC.** Operates on the principal of a closed heating system. Quick starts. Quick shutdown.
- **OIL and/or GAS FIRED** — low-pressure, atomizing-type burner.
- **SAFETY CONTROLS** — protect circulating system against low oil level.
- **MAXIMUM HEAT TRANSFER**—Exclusive "Peak-Temp" feature: Colder oil returned from circulating system is baffled to maintain best heat transfer efficiency.
- **SELF-CONTAINED** — includes pump, valves, piping, temperature and low-level controls, electric motors and controls.
- **AVAILABLE IN TWO SIZES** of stationary, electric-driven units: Series 1200—and Series 1800.

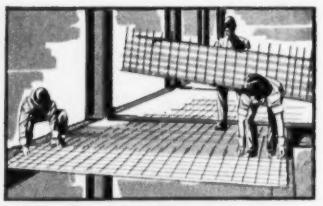
COFAR* cuts concrete costs, reduces construction time by months! Here's how...





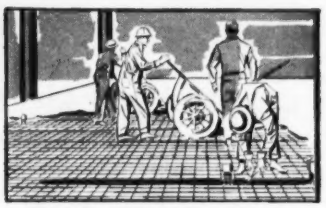
ARRIVES CUT TO FIT

Cofar "tough-temper" steel units arrive at the job site cut to fit the building frame. They are conveniently bundled for individual bays which eliminates on-the-job sorting.



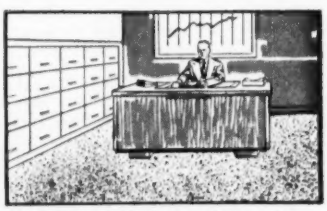
EASY TO PLACE

Weighing only 2 lbs. per sq. ft., units are easily handled. Cofar placing follows directly behind structural steel erection. Units are welded in place, providing additional lateral strength to the building frame.



TRADES MOVE IN FAST

As soon as Cofar units are placed, working trades move in. Concrete floor and roof slabs become a one-stage operation. Corrugated sheets serve as a tight form, provide complete positive reinforcing at the bottom of the slab.



SAFE—STRONG—DURABLE

Cofar monolithic floors provide complete plate action for concentrated loads and horizontal forces. The smooth, corrugated underside of the units provides an attractive ceiling at no extra cost when plaster and acoustical ceilings are not required. Hot-dip galvanizing insures building life permanence.

*WHAT IS COFAR?

Cofar, a trademark of Granco Steel Products Co., is manufactured from extremely high strength cold-reduced steel. It consists of deep corrugated steel with T-wires (transverse wires) welded across the corrugations in manufacture.

Cofar units provide main reinforcement, while the T-wires provide composite temperature reinforcement, mechanical anchorage and shear transfer from the concrete to Cofar. Thus, with Cofar serving as both permanent form and reinforcing, reinforced concrete floors may be constructed without using costly and combustible wood forms.

Completely eliminates wood forms

Imagine cutting months from the construction time of new buildings . . . gaining additional space for occupation or rental, months ahead of schedule! That's exactly what architects and engineers are doing by specifying Cofar concrete construction.

By combining form and reinforcement in one manufactured product, Cofar completely eliminates the need for wood forms. Cofar floors are quickly placed, secured by welding, used as a working floor by trades and then covered with concrete. Result: A safe, high-strength floor.

Cofar provides all the positive steel needed in the structural concrete slab, saves weeks in building time. Cofar design requires no special training or procedure. It can be done by any Architect-Engineer using conventional concrete formulae. Investigate the advantages of evolutionary new Cofar concrete construction today.

FOR ADDITIONAL INFORMATION, engineering assistance or cost estimates, contact COFAR, Dept. ER-3, Granco Steel Products Company, Granite City, Ill.

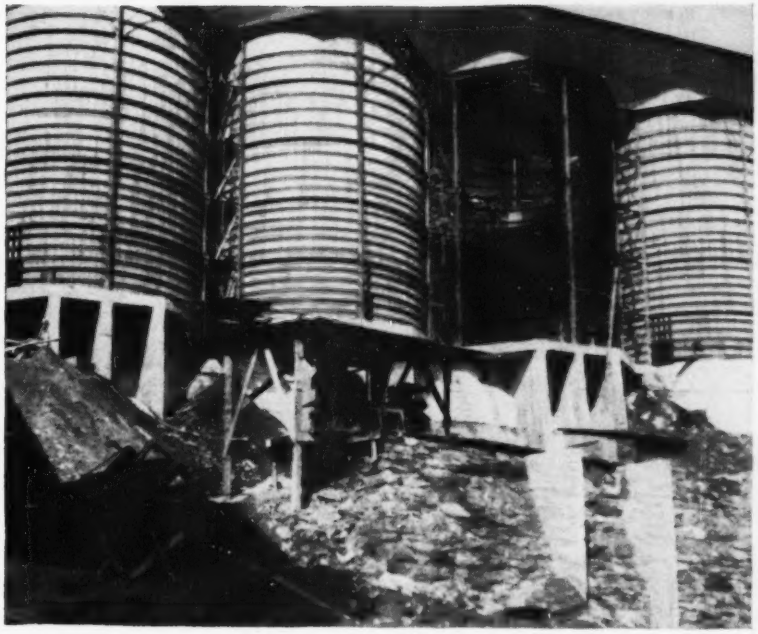
see our catalog in SWEET'S ARCHITECTURAL FILE or write for copy

COFAR

GRANCO STEEL PRODUCTS COMPANY

Subsidiary of Granite City Steel Company

Granite City, Illinois



AGGREGATES WILL BE STORED after screening to size in steel-hooped silos. All construction plant units have to be firmly anchored to resist avalanches.

¼ in.; ¼ to 1½ in.; and 1½ to 5 in. Since the primary crusher product is deficient in the small sizes (sand), secondary crushing facilities for these sizes are a part of this plant's equipment. Handling of materials in this plant, which is a timber-framed building 160 x 80 ft in plan and 65 ft high, is by belt conveyors for horizontal movements and by chutes and bucket elevators vertically.

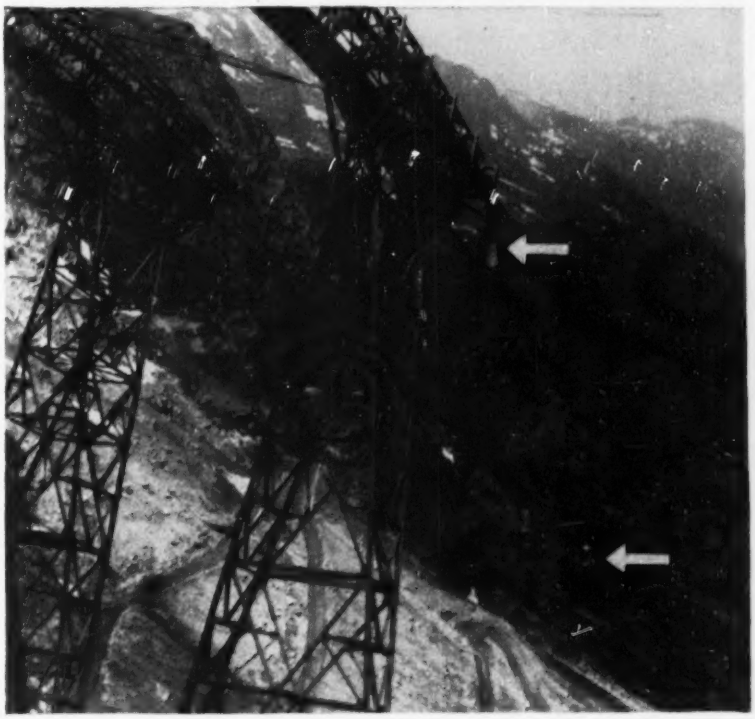
The product of the screening and crushing plant is discharged to five 50-ft diam by 66-ft high steel-hooped timber silos, each of 4,550-cu yd capacity—one silo for each size of large aggregate and two for sand.

• **Cement supply**—The facilities required to bring cement from the railhead at Sion to the concrete mixers represent one of the most expensive plant items on the job and, from an American point of view, at least, one of the most interesting. They include two 11-mile long teleferiques—endless ropeways carrying attachments for cement containers every 220 ft—with dispatching and receiving terminals and two 900-ton bulk cement storage silos at the job. Each of the teleferiques delivers 50 tons of cement per hour in cylindrical steel containers of 880-lb capacity each. The ropeways are supported on steel towers, and from a distance have the appearance of two parallel electric transmission lines as they stretch across the mountains from Sion at El. 1,680 ft to the job receiving terminal at El. 7,640 ft.

This method of handling cement, which has become accepted practice for hydro projects in the mountains of Switzerland, France and Italy, is a thoroughly mechanized operation. Thus the empty containers at the cement manufacturing plant are loaded on railway flatcars (and sometimes on motor trucks) and then moved beneath storage bins to be filled. Transported to the job's railhead, the containers are easily unloaded onto a receiving platform since the beds of the flat cars are equipped with a series of rollers. The height of the receiving platform is also adjustable vertically by hydraulic jacks so that a part of the platform can be taking on full containers while on another part empties are being loaded on another car of the same train—which would be at a higher level since its springs would not be depressed so far. The platforms can also be sloped toward or away from the train to aid in moving the containers more easily.

The teleferiques pass by the rear of these receiving platforms, so that the empty containers can be removed readily from them and the full ones hooked on. Each container is provided with trunnions on either side which engage hooks hanging down from the ropeway carriage.

Upon arrival at the receiving terminal at the dam site, the containers are disengaged automatically from the ropeway, and slid along on a roller conveyor into a dustproof housing. As the door of the housing closes, the container is tipped and emptied into a bin from which the cement is carried by screw and bucket conveyors to the storage silos. Two pumps, each of 40 tons per hr capacity, transfer the cement from the silos to batching



TELEFERIQUE TOWERS mark job terminal of cement supply system. Arrows identify cement containers moving on the ropeway. Note serpentine road below.

This GMC Model 450 dump calls on an extra-heavy, ruggedly reinforced chassis to stand up under off-the-road strains like this — trip after trip, job after job. Extra-long, "pillow-action" springs cushion out shock. And this all-over stamina is backed by the extra power of GMC's great "302" engine — pound-for-pound the mightiest in gasoline truck history. It develops 7.2 to 1 extra-high compression—uses regular fuel.

What Kind of Shape is This Truck In?

A Turning Radius as short as 20 feet makes GMC cab-over-engine trucks ideal for certain construction jobs that demand a lot of maneuvering in tight spots. Better weight distribution over the front axle allows for bigger loads within axle and legal limits. GMC c.o.e. models are available in 8 gasoline and Diesel models covering the 16,000 GVW-65,000 GCW field.

As you can see, the truck above seems to be wrenched out of line by its heavy load and the ragged footing.

But it isn't. That truck's still in top shape.

You see, it's a GMC. Its chassis is built to shrug off those murderous twisting strains—not just once, but job after job. Its extra-tough springs will cushion millions of jars and jolts before they're through. Its axles have strength to spare.

All this is teamed with GMC power that asks no smooth highway for its hustling action. "Impossible" rock pits, quagmires and mudholes are no barrier. A burly GMC engine demands no pampering—stays young *years* longer.

A Cinch To Drive

A tough truck? Sure, but easy on drivers—and on itself. The comfortable "Six-Footer" cab is insulated from shock. Recirculating ball bearings take the strain out of steering. So maintenance needs are fewer—upkeep is lower.

But only your GMC dealer can give you the whole story. Why not drop in and find out *all* the advantages of using a *real* truck—a GMC!

GMC TRUCKS

GASOLINE 4,800 GVW to 90,000 GCW
DIESEL 19,500 GVW to 100,000 GCW

GMC Truck & Coach Division of General Motors

bins in the concrete mixing plant. A total of 315,000 tons of cement will be required for the first stage of Grand Dixence Dam, and 1,100,000 tons ultimately.

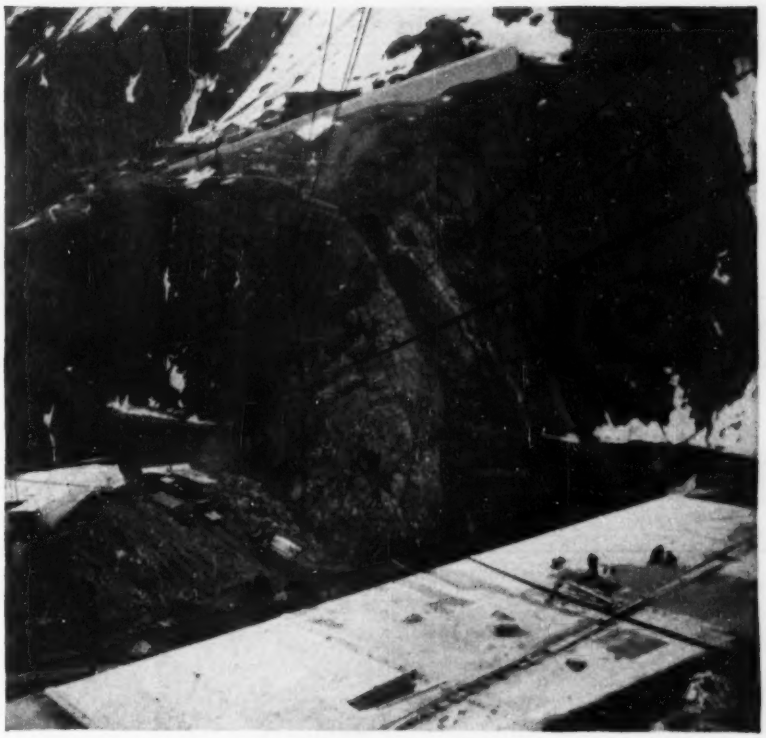
• **Concrete mixing and placing**—The concrete mixing plant is designed for a minimum output of 325 cu yd per hr, but under favorable conditions can turn out 390 cu yd per hr. It contains two complete installations of batchers and mixers, both operated from a single push-button control panel. The batching bins are cylindrical, with the cement compartment in the center surrounded by compartments for the four sizes of aggregate. The mixers are in batteries of three, set radially and discharging into a common hopper in the center. Of tilting type, each mixer is of 3-cu yd size.

Two roadways beneath the mixing plant accommodate batch trucks that haul the concrete a short distance to the cableway loading dock and discharge directly into the 8-cu yd. cableway buckets.

Four 2,850-ft span, 20-ton cableways are required to cover the entire area of the dam. There is a single fixed tower on the left bank, with the four movable towers opposite. In order to serve the progressive heights of the dam and to eliminate the need for expensive excavation on the sheer cliff face the 1,016-ft long track on which the movable towers operate by rack and pinion is on a 35% slope upstream, believed to be an innovation in cableway installations. The cableway carriages can travel (8 ft per sec) and hoist (17 ft per sec) at the same time, and when all four are operating can place 6,500 cu yd of concrete in two 10-hr shifts.

The concrete will be placed in 5½-ft lifts, with an interval of 3 days between pours. The concrete will be cooled by circulating water in a system of embedded pipes.

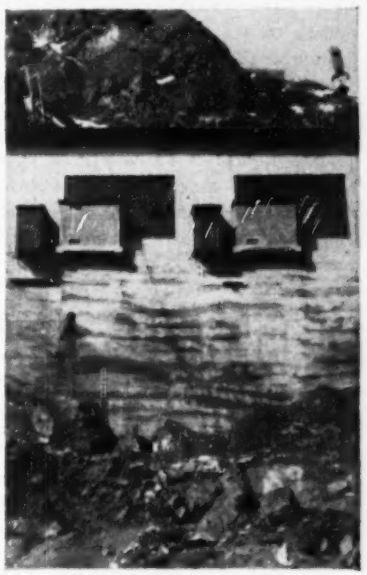
• **Construction difficulties**—Assembly and erection of these plant units in rugged, precipitous territory at the very toes of Alpine glaciers was beset with many difficulties and dangers. The omnipresent one is from avalanches, and constant care is required to prevent them or to protect the construction plant and work from falling rock and debris from the steep slopes and cliffs that wall the site on two sides. Actually there isn't much that can be done to prevent a full-sized avalanche, although controlled clearing of loose rock at the right spot frequently can stop one before it starts. All plant buildings are firmly anchored into rock, and the roofs of some of the structures, notably that of the cableway hoist house, are reinforced to resist avalanche loads. Power shovel and tractor cabs are also encased in heavy logs to furnish protection for the operators.



FOUR CONCRETING CABLEWAYS span the gorge where the Grand Dixence Dam is being built. Their movable towers operate on the inclined runway benched into the opposite cliff, while hoists will be housed under impact-proof roof in foreground.

Building the initial access road with its 32 switchbacks to effect a 1,300-ft rise in 3 miles was in itself a difficult task. Once this had been done, construction of a village for 530 workmen at El. 7,000 ft (about the base of the dam) and of another for 200 workmen at El. 7,900 ft (near the screening plant) required leveling out precipitous areas and installing water and sewage lines in the fill or often in solid rock. Abutment scaling for the dam itself was a spectacular and hazardous job, which was also equaled by the construction of the inclined track for the movable cableway towers, which is literally benched out of the sheer cliff of the right bank of the gorge.

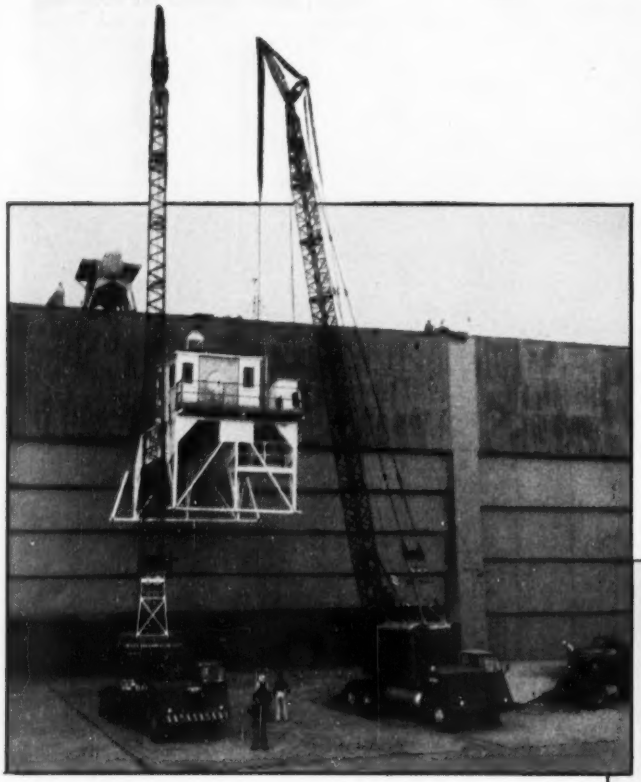
About the only favorable condition to be met with in the construction of Grand Dixence Dam is the lack of necessity for diversion tunnels or cofferdams. The existing Little Dixence Dam, 1,300 ft upstream, is a perfect cofferdam, and its power tunnel can carry all of the accumulating water safely past the construction—or more exactly, under it. This favorable condition, plus the now-ready construction plant, assures that next season the big job of manufacturing and placing concrete can begin in earnest. With a construction season of only 5 months a year it will require 15 years to finish the job, but in the end Switzerland will be able to boast of the highest dam in the world.



CABLEWAY HOIST HOUSE showing two of the four operators' cabs.

All lifts are easier with a CRANEMOBILE

...on TWIN lifts for instance



There's only one way you can beat the performance of a BAY CITY CraneMobile on high lifts or heavy lifts and that's with a pair of CraneMobiles. Here, one team of CraneMobiles is handling a twin lift on a 7-ton antenna tower atop a 60-ft. hangar at Long Beach, California. And another pair of CraneMobiles is skidding wood floats into the Mississippi River at the Minneapolis Yacht Club. That's typical of the way these powerful, efficient, versatile cranes make all lifts easier and every job faster. Both crane and carrier are engineered and built as a unit by BAY CITY to give you a balanced machine with a low center of gravity. CraneMobiles are available in capacities up to 25 tons . . . a selection of carriers to suit job requirements.

Compare these advantages . . . a few of many.

- Collapsible high-gantry permits raising maximum recommended boom lengths from horizontal without outside assistance.
- Accurate, fast independent boom hoist will raise or lower boom, or boom and load, under power only.
- Power load lowering device may be quickly engaged or disengaged to lower heavy loads smoothly and with precision.

Your BAY CITY dealer can give you complete information about CraneMobile. See him today. BAY CITY SHOVELS, INC., Bay City, Michigan.

Handy pocket-sized booklet of facts and features tells why "all lifts are easier with a CraneMobile". It's loaded with interesting information, it's nicely illustrated and it's yours for the asking. Just write us.

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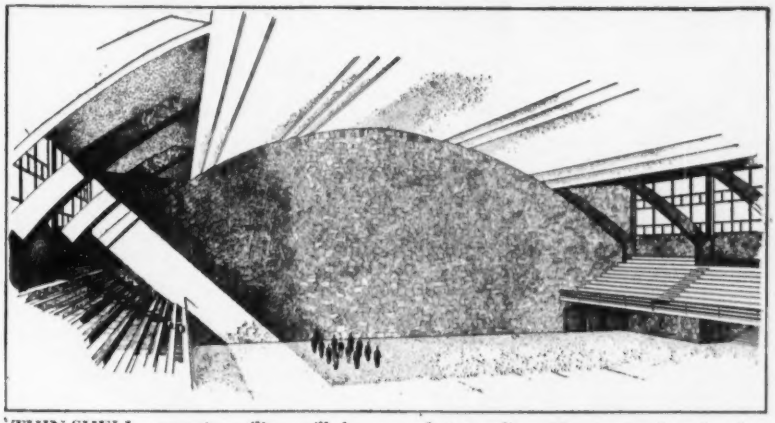


THIN-SHELL concrete ceiling will be poured integrally with structural arch ribs.

Arches support flat roof of armory

Thin-shell concrete arch construction under flat roof will allow a smooth ceiling, daylighting

Spanning 171 ft, the arched concrete thin-shell ceiling and roof structure of a new armory in Cincinnati, Ohio, will cover a clear floor of 240x164 ft. Under construction for the University of Cincinnati, the $1½-million structure when completed will seat 8,000 people.

Concrete arch ribs will carry two levels of flat roof and the thin-shell concrete ceiling. The main or higher flat roof, concealing the arch structure, will be formed of steel shapes and metal decking. The lower, concrete side roofs will be monolithic continuations of the thin-shell ceiling. This lower level side roof will be a 6-in. thick inward sloping slab.

With a variable thickness between 3½ and 6 in., the thin-shell concrete arch ceiling will span a 110-ft wide central section of the armory. The crown of the arch will be 63 ft from the finished floor. The remainder of the playing floor and the balcony seats in the armory will be covered by the sloping lower level roof slab. The break from the arched thin-shell to the inward sloping slab makes possible a line of windows for daylighting along each side of the armory.

• Arch supports—The reinforced concrete arch ribs, carrying the two levels of roof, run throughout the 240-ft length of the structure on 24-ft centers. Springing from 2-ft 6-in. wide by 6-ft 8-in. thick concrete columns, the arch ribs will be 2½ ft wide and 7 ft thick at the springing line and 3 ft thick at the crown. The thrust of each rib, carried down through the 28-ft high columns, will be taken by three 2⅞-in. dia rods placed 2 ft below floor level in a concrete trench. Each tie rod will be adjustable with two turnbuckles. The tie rods make possible a two-hinged arch design that will not produce any horizontal thrust on the column foundations.

At each end of the armory, the arch ribs are about half as wide as the typical beam, and their thrust, transferred through the end columns, will be taken by only two tie rods.

• Forms for in-place concrete—All of the concrete structural work in the armory is to be poured in place. Since the ceiling shell is located at the bottom of the arched ribs, forming the smooth concrete shell will be simplified. The forms are to be placed on sectional timber centering that will move on steel rollers on rails.

Screw jacks built into the centering will raise or lower the plywood forms as the centering moves forward pour by pour. Concrete for the main roof and columns will have a 28-day compressive strength of 5,000 psi.

The general contractor expects to do a considerable amount of welding of reinforcing bars to facilitate work in carrying out the continuity of the structural design.

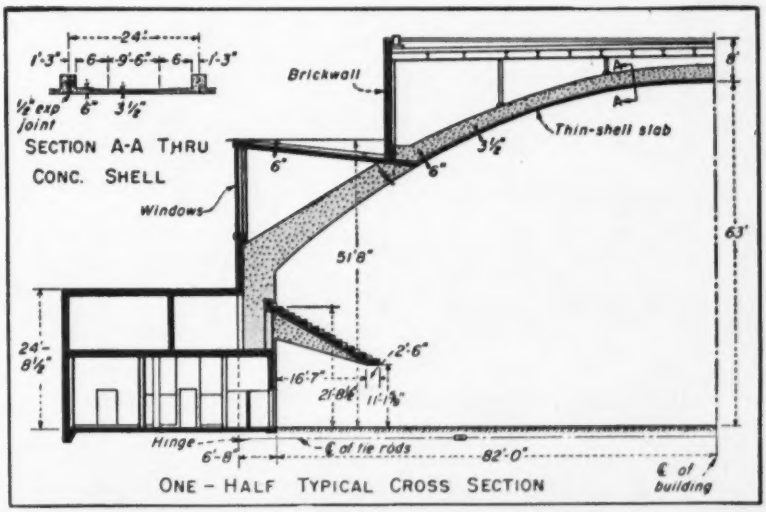
• Attic keeps ceiling smooth—The smooth thin-shell ceiling in the armory will have 16-in. openings for lights and 5-ft dia openings for ventilation so that the fixtures will not protrude past the ceiling surface. To contain ventilation equipment, ductwork, and light fixtures—all accessible for maintenance—a flat-roof attic will cover the whole arched thin-shell.

Balcony seats, along each side of the playing floor, will be cantilevered from the columns carrying the arched roof beams. Locker rooms and office space will be built along both sides of the armory proper.

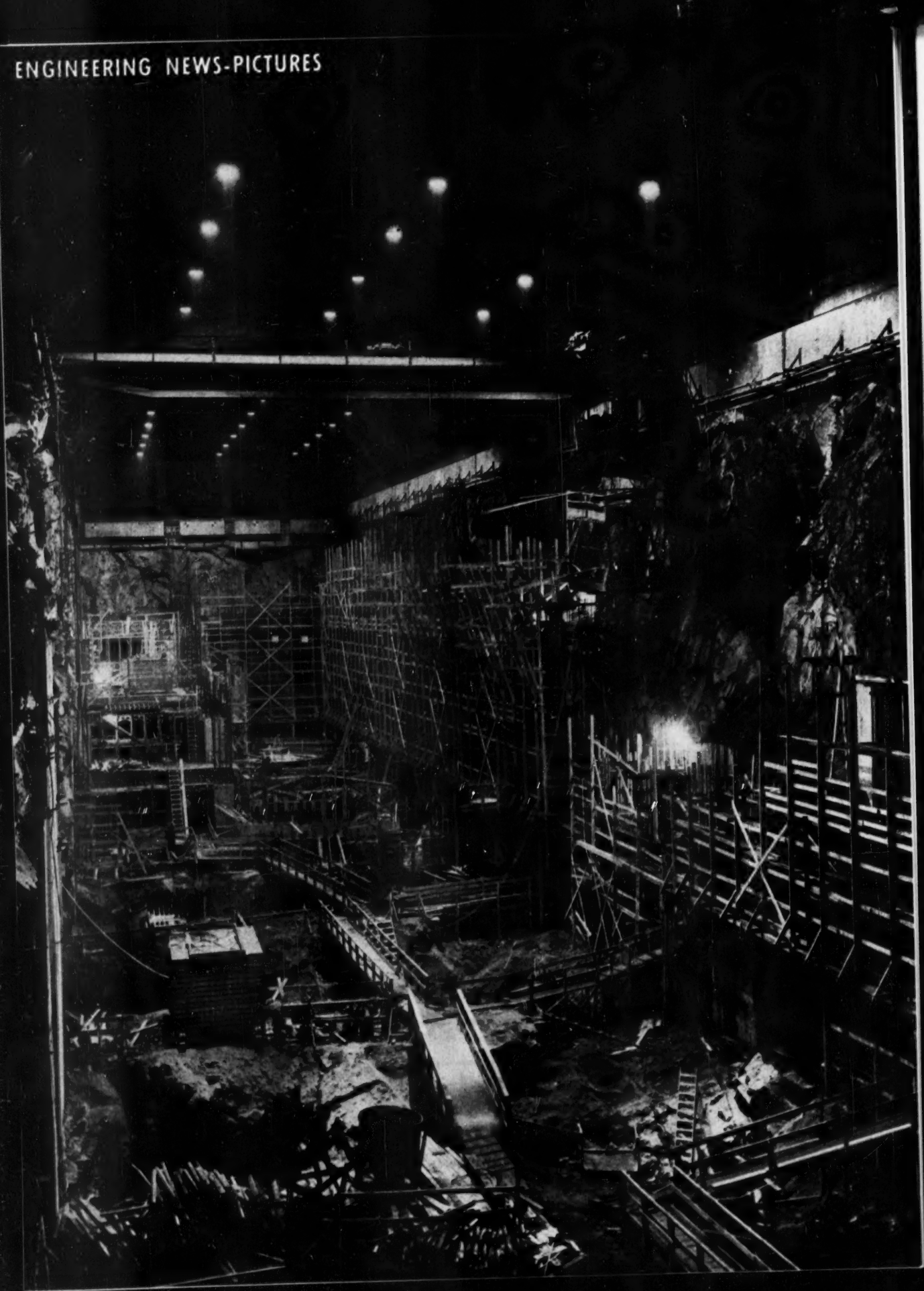
Flooring for the main area will be an 8-in. thickness of fine sand, wetted down and rolled to a medium compact surface.

Column footings are carried to layers of stratified limestone and blue shale. In one corner of the building the footings are 44 ft below finished floor level while on the opposite side they are only about 3 ft below floor level.

Structural engineers and architects for the building are James E. Allan & Associates, and architecture was worked out in conjunction with Potter, Tyler, Martin, and Roth, both firms of Cincinnati. Frank Messer & Sons, Inc., also of Cincinnati, is the general contractor.

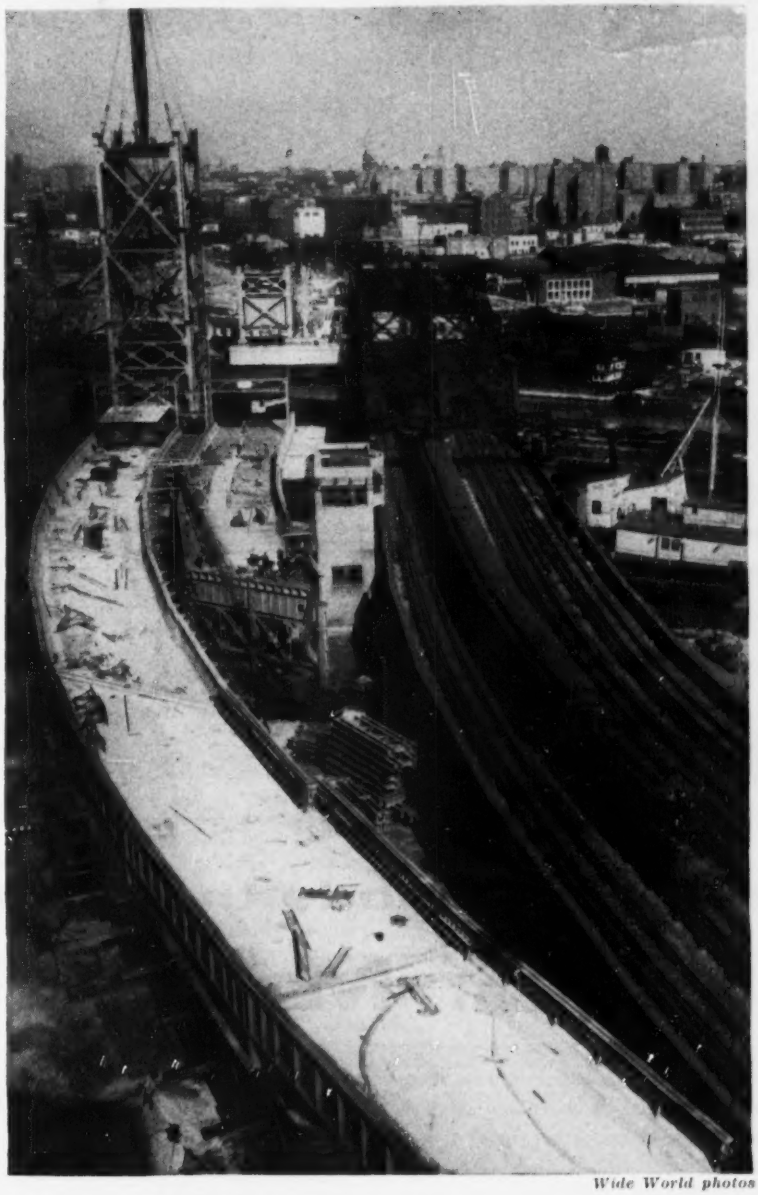


CONCRETE RIBS spring from side columns. Thrust is taken by tie rods below floor.



MAMMOTH CAVE, all man-made, is underground power house for Aluminum Company of Canada at Kemano, B. C. (ENR Nov. 13, 1952, p. 31). House is 700 ft. long, 81 ft. wide and 140 ft. from bottom of tailrace channels to top of arch concrete. Arch was built first, to protect rock excavation downward to tailrace tunnels. Contractor is Morrison-Knudsen Company of Canada. First power and aluminum production is expected in 1954.

BIG SWITCH in New York Central operation across Harlem River (right) in New York will be complete in 1956. Obsolete swing span will be replaced by a pair of lift spans (left) with faster, more efficient operation. River navigation then will cause briefer interruptions of four-track train service in and out of busy Grand Central Terminal. Water traffic also will benefit, by elimination of swing bridge's center pier. American Bridge Co. has superstructure contract, which accounts for about half of project's $18 million cost.



Wide World photos

SAN FRANCISCO FACE-LIFTING reveals results of work on the $45-million Bayshore Freeway, routed to run inside city limits for 6½ miles. The old road between Army and Bryant streets (lower left) was lined with houses. Today the same scene (lower right) includes a new 2-mile-link of the freeway. Nearly half the cost of this section (total: $9.3 million) went for right-of-way. Highway's aim is to ease traffic past a major industrial-commercial area (ENR, Nov. 20, 1952, p. 50).

These shallow pan-like forms, here being used in constructing the new Iolani School near Honolulu, were made of Mayari R low-alloy, high-tensile steel. The superior strength of Mayari R permitted a much lighter, easier-to-handle form.

Why they made these concrete forms from MAYARI R

Out in the Hawaiian Islands, where lumber is relatively costly, they've found that steel forms serve well in such concrete work as floor slabs, columns, walls, roofs. But steel can be heavy, too . . . and where forms have to be moved about by hand, weight becomes a critical factor.

This problem was neatly solved by the designer of the forms shown above, when he hit upon the idea of fabricating the forms of Mayari R steel. With a yield point nearly double that of ordinary carbon steel, Mayari R could be used in much lighter-gage sheets without sacrificing the strength needed to support the heavy loads. It gave a smooth finish to the concrete surface, and its superior resistance to atmospheric corrosion assured long life for the forms.

Concrete forms are among the latest of hundreds of ways in which Mayari R is being used to good advantage. In bridges, buildings, motor vehicles, and a wide variety of steel products, this versatile steel is cutting down deadweight, adding strength, fighting corrosion. Our Mayari R catalog may suggest some new and better ways of doing things that you'll be glad to know about. If you would like to have a copy of this interesting book, just write or phone our nearest office.

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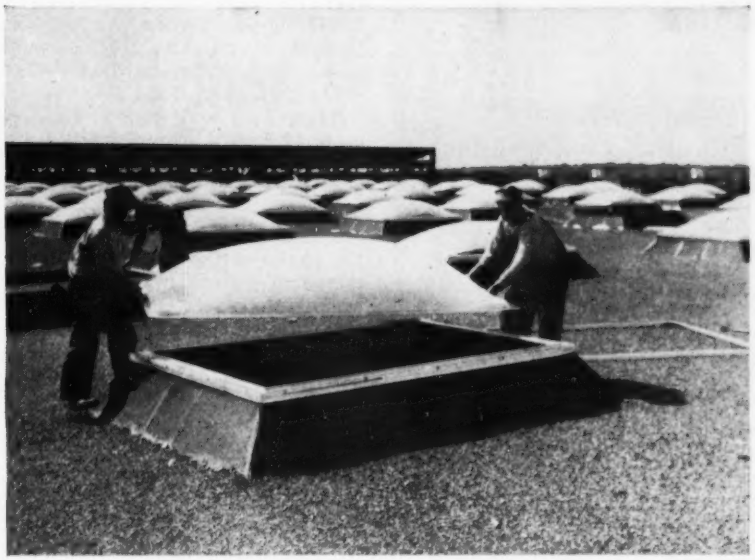


TRANSPARENT PLASTIC DOMES, with a temporary thin protective coating, are set in aluminum frames to form skylights at a new Signal Corps depot, in Tobyhanna, Pa.

Plastic domes daylight big pumped-gypsum roof

Construction of a new $33-million depot for the U. S. Signal Corps at Tobyhanna, Pa., has developed intriguing techniques both below ground and above—below because of the formwork one contractor used for foundations, and above, because of the roof construction. Also included in this huge project is the first large installation of plastic skylights.

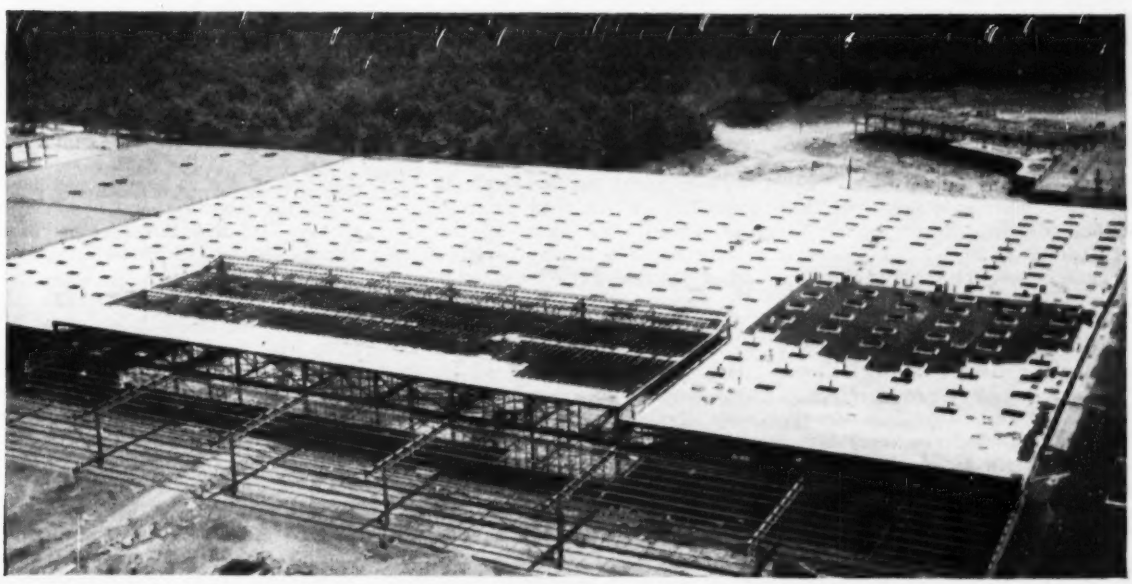
The Tobyhanna depot, located on a flattened hilltop about 20 miles southeast of Scranton, is being built under several contracts. The major share of the project—21 buildings, a sewage treatment plant, a complete utility system, 250,000 sq yd of asphalt paving, and two 600,000-gal ground storage reservoirs—is currently being constructed by Merritt-Chapman & Scott Corp. under a $17-million contract. Earlier, Rochez Bros., Inc., of East Pittsburgh, Pa., had flattened the hilltop, moving 3,700,000 cu yd of earth, and Consolidated Construction Co., Inc., of Woodbury, N. J., had built four warehouses. Construction of all the buildings at the depot involved enclosure of 64,200,000 cu ft of space, providing 3,160,000 sq ft of floor area.

The structures include seven 1,200x200-ft warehouse; a U-shape master operations building, with a 500x400-ft base and two 1,200x200-ft wings; an administration building with four 200x25-ft wings and one 260x100-ft wing; various utility shops and warehouses, and a central heating plant. The administration building is of reinforced concrete construction; the others have structural steel frames.

Formwork for the concrete administration building, being built by MC&S, is of interest because of the simplicity with which it was assembled and stripped. Beam and girder forms, for example, were held together by wedges, rather than by nails.

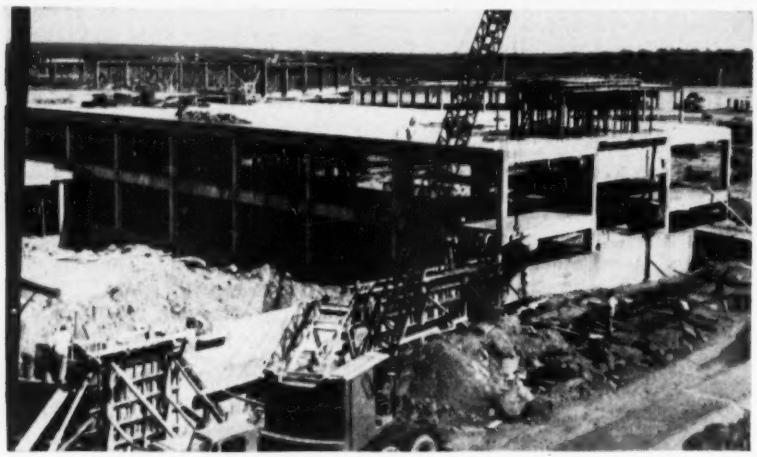
• **Novel roof**—The steel framing of the warehouses, where column spacing ranges up to 66 ft, is noteworthy because of the use of hung-span construction. Girders cantilever over the tops of the columns about one-fifth the length of the adjoining bay to support the ends of neighboring girders. This design requires less steel than for simple-beam construction.

Open-web joists span between the girders. These members support roofs consisting of 1-in. thick glass-fiber insulation board, 2-in. cast-in-place gypsum deck and builtup roofing. The insulation board, supported on steel T-purlins, served as a form for the gyp-



GYPSUM ROOF of a large building in the depot is bespeckled with skylights. Open-web steel joists support the roof.

ROOF FORMS are 1-in. thick glass-fiber insulation boards. Workmen stand and walk on the steel T-purlins supporting the insulation board, until the gypsum, which is pumped into place, has set.



ONLY CONCRETE BUILDING in the depot is the administration building. The foundation wall (left) was cast in prefabricated plywood forms.

sum deck. Generally, its underside was left unpainted and serves as a ceiling.

The gypsum was pumped from ground level into the forms, by a subcontractor, Hoge-Warren-Zimmerman Co., of Cincinnati, Ohio. This is the largest application of this method to date.

• **Plastic domes**—The roof of the Base Maintenance Shop, which will occupy the 500x400-ft wing of the Master Operations Building, is pierced by 585 rectangular apertures in which dome-shape transparent plastic sheets have been fitted to admit daylight into the interior of the structure. Formed from ⅛-in. thick sheets of thermoplastic acrylic resin, the domes are 64x96 in. in plan and have a rise of 19 in.

The skylights were easily and swiftly installed. First, a frame of extruded aluminum was screwed to a wood border around an opening. Then, two men set the plastic dome. Finally, a second aluminum frame was placed over the edges of the plastic and screwed down, with neoprene washers and gaskets as seals.

• **Floor joints cut in**—Floors in the buildings are 6-in. thick concrete slabs on ground. To speed up the job, which required placing of 40,000 cu yd of concrete, MC&S elected to cast the floors in continuous strips 200-ft long (the length of each bay) and 50 ft wide—a departure from the procedure frequently required on government work of placing concrete in alternate, checker boards panels of 800 to 1,200 sq ft, to control cracking. After the continuous strips had set, 1¼-in. deep grooves were cut along column centers with a diamond-pointed circular saw, to form contraction joints.

• **Simplified formwork**—MC&S also placed a great deal of concrete for the foundations of the buildings—about 17,000 cu yd. Perhaps the fact that foundation walls have a total length of 8.1 miles presents a better picture of the magnitude of the job.

These walls were built in trenches up to 14 ft deep excavated with backhoes. To hasten excavation and to overcome delays due to the presence of boulders and rock, two wagon drills preceded the backhoes to investigate the nature of the subgrade. Whenever hard material was encountered, explosives were placed in the exploratory holes and fired to break it up.

Forms for wall footings were simply 2x12-in. planks. These were held in place by 1x4-in. spreader boards spiked across the top with double-headed scaffolding nails. These nails could be easily pulled to strip the forms. Short lengths of reinforcing bars were driven through holes in the projecting ends of the spreaders into the ground to pin the forms in place.

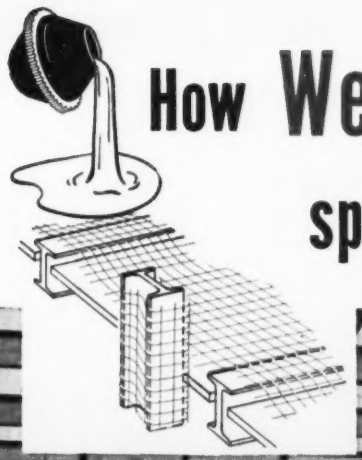
Walls forms were 2x8-ft prefabricated wood panels, consisting of ⅝-in. thick plywood on a 2x4-in. frame. As each course of panels was positioned, through-wall ties were set along the top edge, making it unnecessary to drill tie holes in the forms. Extension of the plywood ⅛ in. beyond the frame at top and bottom left sufficient space between panels for the wire ties when the panels were laid up one on top of the other. The ties were embedded in the sheathing with a hammer blow.

Ends of the panels were clamped together with short form ties through holes in frame verticals. Tops of the assembled wall forms were kept from spreading by 1-in. wide yokes of 16-ga steel.

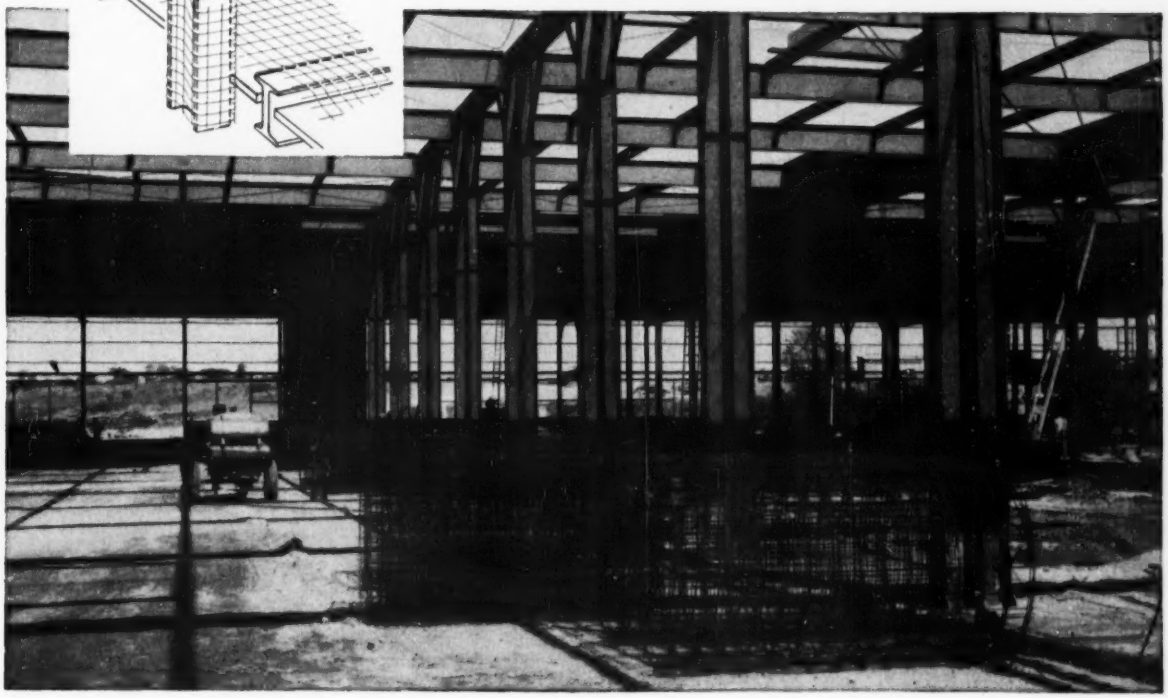
Double vertical 2x4-in. strongbacks, shored to the side of the trench, braced the forms where panel ends butted. Additional walers were not needed, because the horizontal members of the panel frames were adequate as horizontal bracing.

The U. S. Signal Corps depot at Tobyhanna, Pa., is being constructed under the direction of Col. Walter Krueger, Jr., district engineer, Philadelphia District, Corps of Engineers, with Lt. Col. Charles S. Tucker as resident engineer. Gilboy, O'Malley & Stopper of Philadelphia are architects, with C. F. Petrullo as project manager.

For Merritt-Chapman & Scott Corp. N. W. Eastwood is New York project manager, George A. Deane, resident project manager and Edward M. Card, project engineer. Roof construction and installation of skylights, was carried out by Columbia Cornice Co., Cambridge, Mass. Wasco Flashing Co., Cambridge, Mass., manufactured the skylights.



How Welded Wire Fabric speeds up building construction



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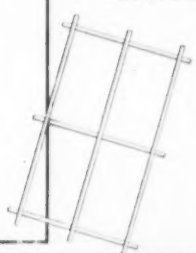

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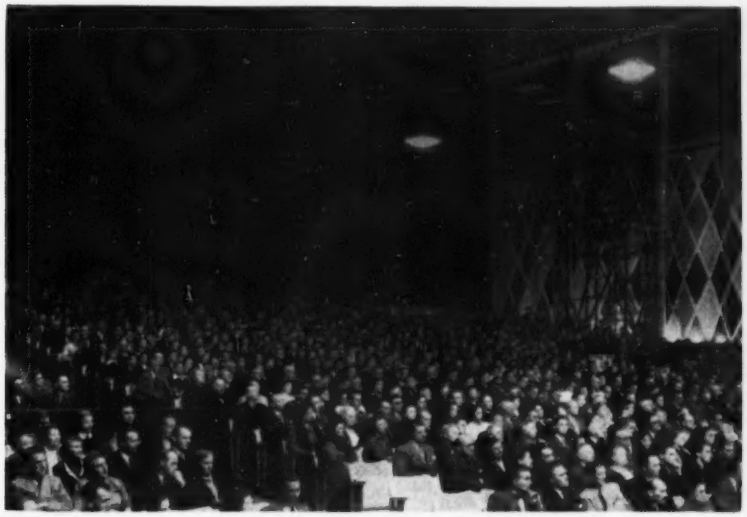
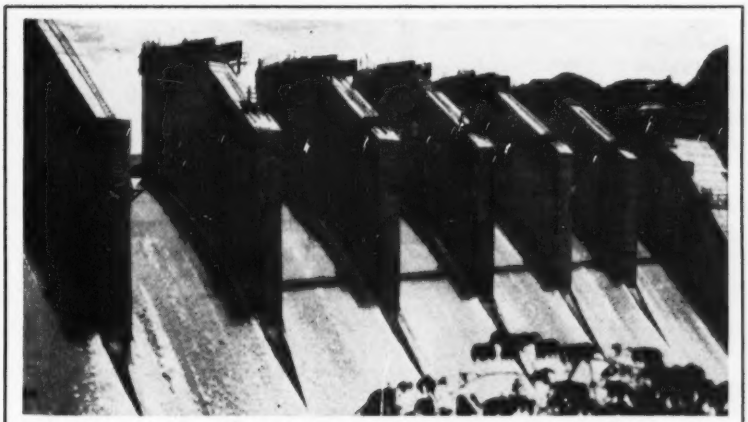


AUDITORIUM of new civic center, Aalborg, Denmark, is provided by moving forward the sliding back wall of the 236-ft long main hall to decrease the room's depth to 146 ft. Tiers of seats are brought up in sections on elevator from the basement.

Sliding wall, acoustical aids feature in all-inclusive civic center

In Denmark a highly integrated community center, recently completed in the town of Aalborg—a city smaller than Harrisburg, Pa.—is particularly notable for the number of facilities it offers to the 85,000 inhabitants of the city.

A main hall that can be adapted to the needs of a large industrial fair or transformed into a concert auditorium



Rio Lempa is Central America's largest hydro

El Salvador's $25-million Lempa River hydroelectric project is nearing completion and is expected to be in operation early next year. When in full 45,000-kw operation, the Lempa project will make El Salvador the largest producer of electric energy in Central America. Cost of the project will be split between the Salvadorean government and the World Bank. The project has inspired Central American officials to talk of a scheme which will provide more power facilities in countries with the best hydro sites and then make possible the sale of this new power across the borders. Contractor for the Rio Lempa hydroelectric project is J. A. Jones of Charlotte, N. C.

Re-usable fir plywood forms cut application time and costs by 25% —form smooth, fin-free concrete

ON BUILDINGS, bridges, viaducts—fir plywood concrete form panels cut application time and costs by up to 25%. They're light, strong, rigid. Easy to fabricate into cost-cutting built-up form sections. Re-use cuts costs, too. Contractors report 10-15 re-uses with Interior PlyForm, twice as many with Exterior PlyForm and new overlay panels. Plywood-formed concrete requires far less finishing. Big panels mean fewer joints, less leakage . . . smoother, better-looking concrete. For full details write Douglas Fir Plywood Association, Tacoma, 2, Washington.

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Industry trademarks are your guide, guard and assurance of DFPA quality-tested plywood

These trademarks identify quality-tested fir plywood manufactured especially for concrete form work. *Interior PlyForm* (highly moisture-resistant glue) gives multiple re-use. *Exterior Plyform* (100% waterproof glue) gives maximum re-use.

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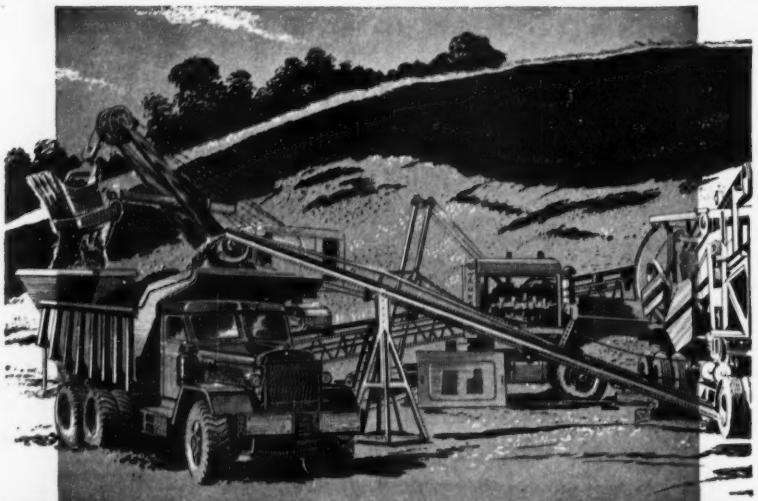

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148-DKU	779 cu. in.	Normal Diesel (Standard Crankshaft)	165 max. hp
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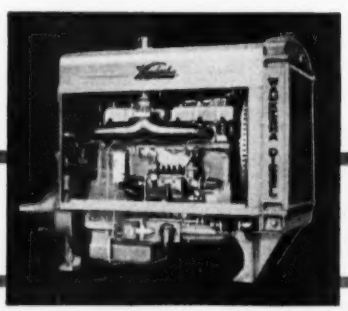

148-DKU DIESEL UNIT
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is only one of the features of the $3-million civic building. There are a restaurant, a shooting gallery, broadcasting studio, bowling alleys, hotel rooms, a smaller theater, even a railroad siding for supplying the building's needs. The structural frame of the civic center primarily is reinforced concrete with cellular concrete partitions and walls. The whole building is 525 ft long and covers an area of 86,000 sq ft.

• **A sliding wall**—For concerts or plays, a 36-in. thick wall at the back of the 236-ft long by 105-ft wide main hall can be moved forward to turn the huge room into an acoustically designed auditorium seating 1,381 people (at full capacity the hall seats 3,334 people). Carried on a steel frame, the sliding wall consists of two specially insulated 12-in. thick facings with a 12-in. air space between them. The wall is suspended from rails running the length of the hall along the side walls. Operated from a control room, the wall can be moved forward mechanically from the back of the hall to place it at any desired room depth. Fourteen welded steel girders carry the roof over the main hall and support the rails that carry the sliding wall forward and backward.

• **Tilted walls**—The walls at the side of the hall are tilted in to eliminate flutter echoes across the auditorium. The sliding wall is set with intermittently spaced panels tilted down so that high frequency vibrations can reach the back row of seats. These panels are placed far enough apart, however, so that not all sound striking the back wall is reflected down to the back rows.

Walls and ceilings of the hall are composed of panels set at angles to each other (sawtooth in section) further to dampen echoes in the hall. Proscenium wings at the front of the stage are especially designed to direct sound from any part of the stage to the back of the hall. The center section of the stage is a revolving platform.

• **Seats on carriages**—When the movable wall is in a forward position and a sloping seating arrangement is required for a concert, seats in five-tiered sections are brought up from the basement on a freight elevator which actually is a combination orchestra pit, rostrum, and freight lift for the main hall. Portable ramps form the aisles between the sloping seats when the chairs at the back of the

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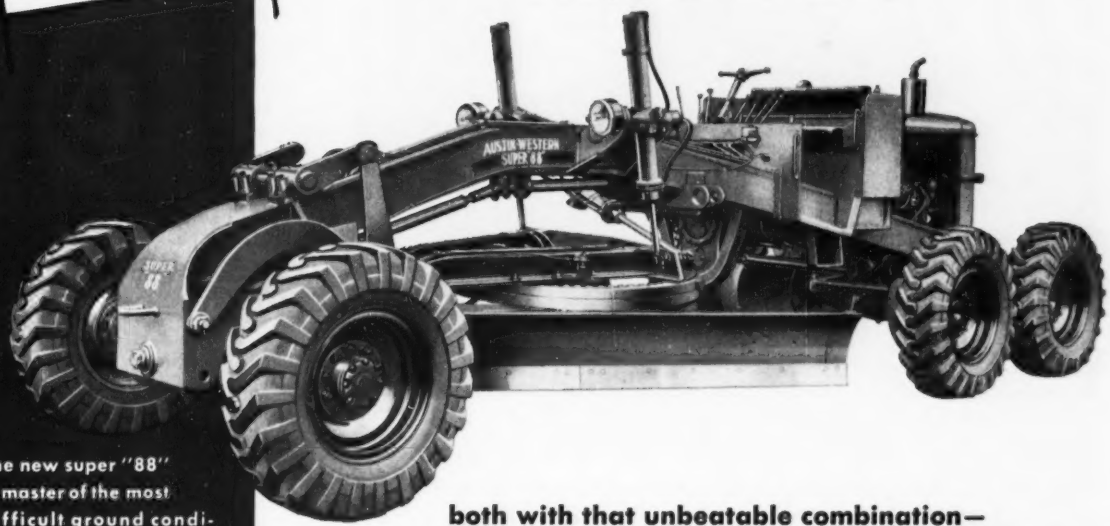

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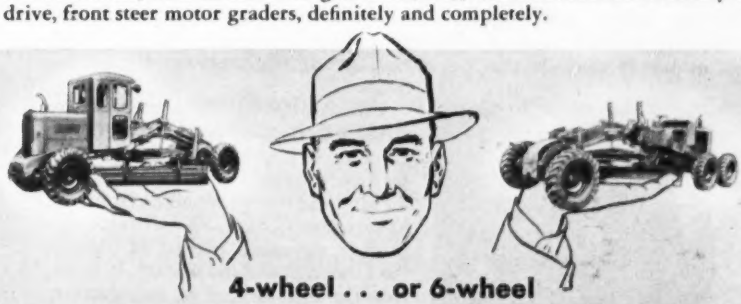

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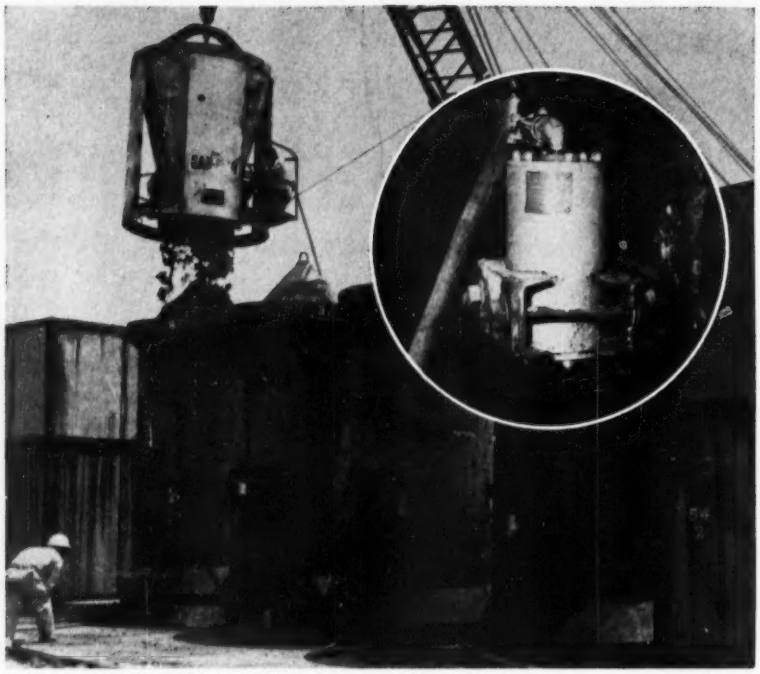

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hall may be as much as 10 or 12 ft above the floor.

• **Reinforced concrete trusses**—Four concrete trusses, spanning 90 ft, support the lifting apparatus in the rigging loft and its roof above the stage. An iron curtain between the rigging loft structure and the roof of the main hall can be dropped across the front of the stage in case of fire.

In the basement, under the main hall, there are an indoor shooting gallery, billiard rooms, and bowling alleys. At one side of the main hall, there are a small theater, a broadcasting room, a music room and cloak rooms. A restaurant, meeting rooms, and administrative offices are at the front of the building, and dressing rooms and hotel facilities at the rear.

Structural engineer for the community center was J. M. Jorgensen, Copenhagen, and architects were Preben Hansen, Otto Krankild, Copenhagen, and Arne Kjaer, Aalborg. Acoustical engineer was Wilhelm Lassen, Copenhagen. In the construction of the building 163 different firms took part.

Dearth of engineers endangers public health

Indonesia desperately needs engineers. Of the nearly 700 Dutch civil engineers employed in public works activities in Java before the war, only about 30 remain. This situation and its implications, especially in public health, are pointed up in a recently released report by Prof. Earnest Boyce of the University of Michigan. It is a report he wrote as the engineer member of a World Health Organization group which studied Indonesia's problems.

It is estimated that there are now less than 100 qualified Indonesian civil engineers in the whole country. This is a ratio of about one to a million people. Professor Boyce points out, as a measure of the seriousness of the problem, that in the Department of Public Works in the city of Djakarta, Java, there is only one city engineer who has only two technically qualified assistants; and it is a city of over 2 million population. Population density of Java is one of highest in the world—1000 per sq mile.

A National Ministry of Health advises provincial and local government agencies on problems of sanitary engineering in environmental health. Its staff consists of a chief engineer and two assistant engineers, plus clerical and draftsman assistance.

• **Field studies** by the visiting WHO team found populations of the 28,000 villages of Indonesia going to the streams for their domestic water needs. Water to be consumed is taken home and "cooked," but bathing and washing go on right in the streams. It will take quite an adult-education program to convince the people that such multiple use of the streams is not compatible with basic concepts of public health, says Professor Boyce, but the task of education will be simplified somewhat by the fact that literacy of about 80 million Indonesians has jumped to 45 percent from a prewar 15 percent. It is hoped that illiteracy will be wiped out in the country in the next ten years.

Water distribution systems in the major cities were not built for present requirements. Development of new supplies and strengthening of existing distribution systems are critical needs, it is reported.

• **Modern sewerage** is practically unknown, but Professor Boyce finds it reasonable to assume that the large cities should find it economical to build separate sanitary sewers to take wastes to points of safe disposal. Street sanitation and refuse removal from portions of the cities are carried out with commendable thoroughness; the principal public health hazard in housing is failure to provide water and sewers in housing areas; and, in general, the country resembles the U.S. some 40 years or more ago, concludes the report.

International briefs . . .

• **Brazilian paper mill**—Parsons & Whittemore, Inc., New York, has announced plans to construct a $6-million paper mill at a site near Sao Paulo, Brazil, for the Compania Paulista de Cellulosa Copas.

• **Public works for Cuba**—Cuba's Compania Constructora Romer Power Electric, S. A., has reportedly proposed to undertake $30 million in public works throughout Cuba. Officials of the National Bank and the Financiera Nacional are engaged in studying the proposals.

• **Cuban skyscraper**—Construction is to start soon on a 33-story, $4.5-million cooperative apartment house in Havana. Occupying a full city block, the project will dwarf anything else in the Havana construction scene. Sponsors of the building are the Mestre Bros., Goar and Abel, and Jose Bosch, all of Havana.

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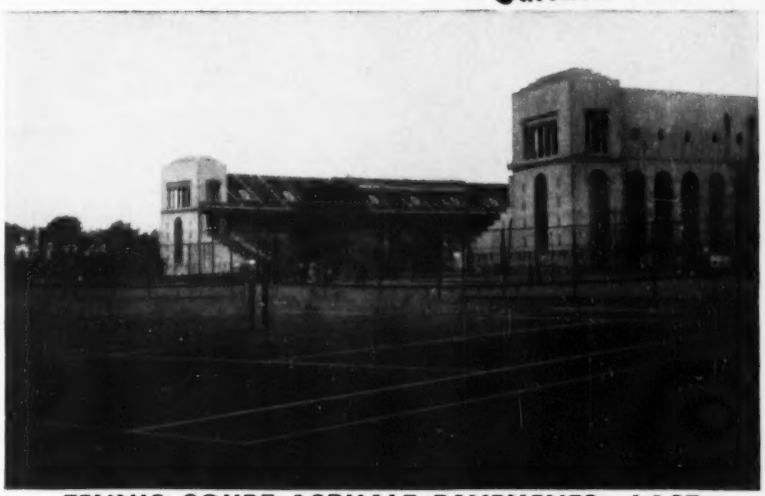
Surface Seal



TENNIS COURT ASPHALT PAVEMENTS—LAST LONGER IF SEALED WITH J-16 BECAUSE:

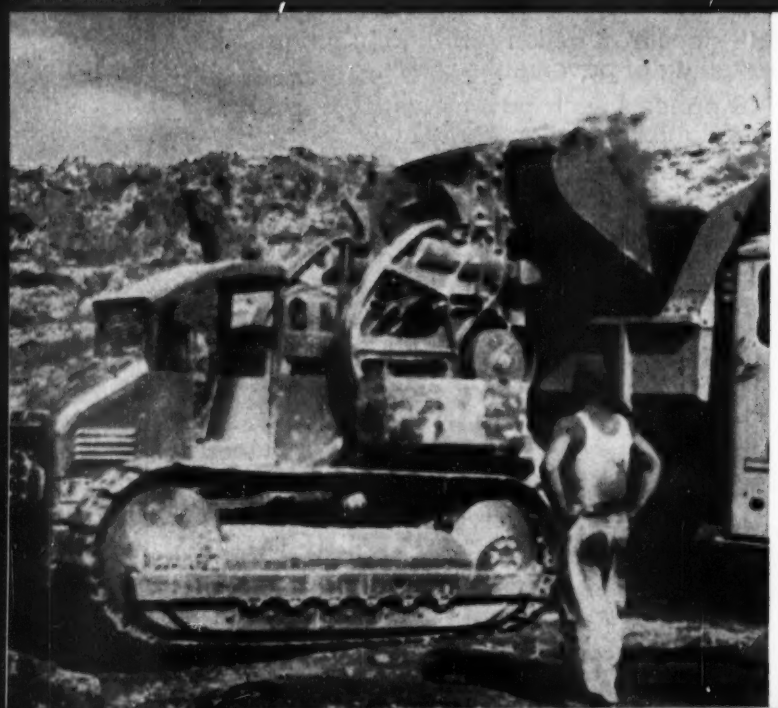
- J-16 stops water seepage which causes softening or failure of base.
- J-16 stops frost action resulting in progressive ravelling of pavement surface.
- J-16 protects such pavements from oxidizing or volatilizing action of the sun.
- J-16 seals in surface oils of asphalt pavements which sometimes smudge tennis balls.
- J-16 provides a long lasting attractive satin-black, tough, easy to clean, wearing surface.

Protective maintenance pays

For complete details on Jennite J-16—Write for Specifications and these two brochures.

MAINTENANCE INC.
WOOSTER · OHIO
CABLE ADDRESS "MINCO"

For 105 at work excavating semi-consolidated material. The machine shown here is on a contract job and is equipped with a 1½ cubic yard bucket equipped with long digging lip and teeth. The extra heavy design of this unit provides the necessary strength to use the machine for actual excavation work. Speed in loading is governed by the travel distance to the truck. With trucks in close the Eimco 105 can easily load at the rate of 6 to 8 yards per minute. Below—The operator sits up front in the 105 where he can get the best view of the work. Discharge of the bucket is controlled by the operator through the Eimco two speed bucket transmission.



Yes! The Eimco 105 is the world's finest tractor excavator! This is the first unit ever designed and built from the ground up with the purpose of performing as a base for heavy-duty attachments to its own frame so that it could be used efficiently for handling many jobs in addition to hauling around other equipment. The 105 is designed for heavy shock vertical loads as well as normal loads imposed through straight drawbar pull.

The Eimco 105 operates freely under all loading conditions, will dig, excavate or bulldoze on even or uneven ground because of its full oscillating track feature even with the bucket attachment.

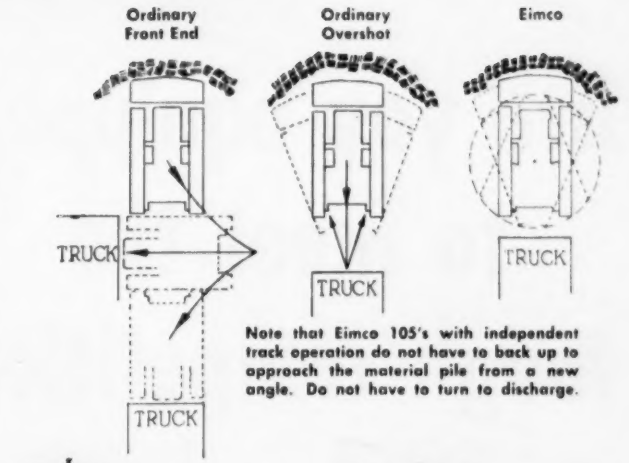
WITH COST SAVING ADVANTAGES

SAVES TIME: Simple, conveniently located handles held in one hand control all movements. Push for forward — pull for reverse — twist for spin turns. This easy control simplifies the operator's work — eliminates turning to dump — eliminates foot clutches and hand shifting and pull brakes — keeps the trucks up close and speeds up the loading cycle.

GREATER DEPENDABILITY: Simple, strong construction of the great new Eimco transmission provides greater dependability. This compact unit contains all of the gearing and clutches for speed changing and full independent reversal of each track. Every moving part is pressure lubricated. The oil-cooled, positive engagement clutches never need adjustment.

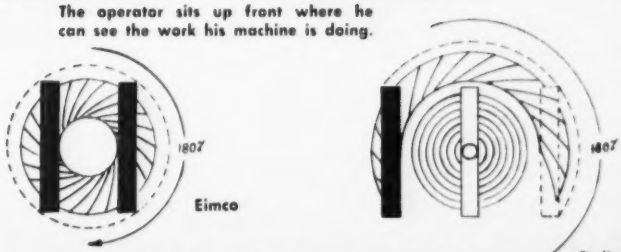
BETTER VISABILITY: The operator in the Eimco 105 sits up front where he can see the work that's being done.

GREATER FLEXIBILITY: The 105 covers the upper bracket range of work done by several models of ordinary tractor equipment in several different price and weight brackets. With the 105 priced with the lower of this group, yet powerful enough to do many of the jobs for which the larger, more expensive, units are employed.



Note that Eimco 105's with independent track operation do not have to back up to approach the material pile from a new angle. Do not have to turn to discharge.

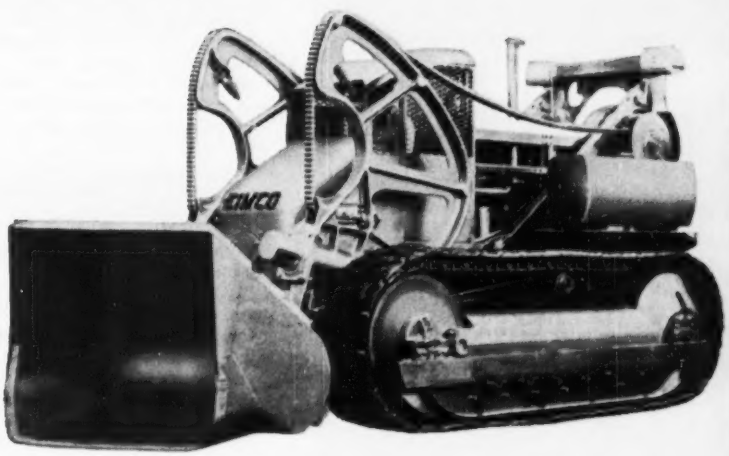
The operator sits up front where he can see the work his machine is doing.



Note: Eimco turns in its own length — makes "spin turns." Ordinary tractors lock one track and walk around.

THE EIMCO CORPORATION
Salt Lake City, Utah, U.S.A.
Export Office: Eimco Bldg., 52 South St., New York City

STRONGER CONSTRUCTION THROUGHOUT: The 105 is made of steel — not cast iron. There is quite a difference in these two construction materials. Cast alloy steel as used in the 105 is not subject to shock cracks even under severe operating conditions. Steel stands strains and stresses imposed by heavy loads without danger of failure. The Eimco 105 is the only crawler unit made of steel and gives you a superior machine with longer dependable life and lower maintenance costs. This is the machine for your next heavy job. Let us send an Eimco engineer to tell you the facts.



The Eimco 105 — world's finest tractor-excavator

Are you equipped to meet the tough competition ahead

When competition gets tough, it's easier to keep busy and stay in the black with a LeTourneau-Westinghouse fleet. This fast, flexible, modern equipment gives you the pick of the best jobs at the greatest profit.

Drive anywhere for jobs

With LeTourneau-Westinghouse equipment you can take advantage of best working conditions . . . move with the weather . . . make most economical use of manpower and equipment. What's more, you can also profitably handle small yardage jobs you would otherwise have to pass up with your present machines because of the delay and expense of getting to them.

There's no delay waiting for flatbed, no blocking, no time lost loading or unloading with Tournapull or Tournatractor. Operator simply gets on and drives to new assignment . . . machine can be on job 20 miles away in about an hour. It's easy to carry fuel and supplies in trailing unit.

Work longer seasons

You can start earlier in the season and work later with LeTourneau-Westinghouse equipment. Power steer that "walks" Tournapull out of tough spots and unique power proportioning differential that delivers up to 80% of the tractive effort to the wheel on firmest footing let you work in wet spring or fall weather when other earthmovers often are idle.

Convert to fit any type of job

Modern LeTourneau-Westinghouse machines offer you opportunities for steady earnings unequalled by any similar equipment. With versatile, high-speed Tournapull prime-mover or Tournatractor you interchange trailing units to fit the times, the season, and your own profit opportunities. Each fits specific needs for earning extra profits on your own jobs . . . for good pay on sub-contracts . . . or for high-rate rentals. Each new trailing unit costs only about 25% of original complete machine.

Less maintenance expense

LeTourneau-Westinghouse equipment lowers maintenance costs. Simple electric controls eliminate troubles of hydraulic or power take-off systems. Low cable requirements, fewer sheaves cut downtime, reduce rope expense. Tires eliminate more than 500 track parts.

Same simplification of construction also lowers lubrication costs. For in-

FOR 24 YEARS THE LEADER IN RUBBER-TIRED DIRTMOVING

ENGINEERING NEWS-RECORD

MARKET LETTER

Outlook

"Competition among construction contractors is on the upswing and job bidding is getting rougher every day. Getting the lowest bid on a job is becoming quite a feat -- some contractors are shaving profit margins to get the awards.

"Engineering News-Record has completed a spot-survey from coast to coast and finds that contractors are talking about bids which were won or lost by the closest possible margin. These men all agree that business is still good but contract awards are harder to come by. Let's take a look at some of the situations.

"First, present jobs are attracting up to three times as many bidders as a year ago. Second, the spread on bids is becoming very narrow -- public contract awards are often below government estimates. Next, a definite move, on the part of small contractors, to bid on bigger jobs and on different types of construction. Finally, a good number of contractors are branching out and are seeking new localities."

stance, in 1,000 working hours one of the leading competitive dirtmovers requires servicing of 4,960 grease fittings and 1,285 other lubrication points. In same period of time, C Tournapull requires servicing of only 1,037 grease fittings and 752 other lubrication points.

This time and cost, which looks small on a daily basis, is a big item over a period of time. LeTourneau-Westinghouse equipment saves you many profit dollars per season on lubrication alone.

More speed for lowest-net-cost-per-yard

Speed is industry's answer to rising labor costs and lower prices. LeTourneau-Westinghouse machines work and travel at speeds of 28 mph for the 7-yd. "D", 30 mph for the 16-yd. "C". The 186 hp tractor on rubber — Tournatractor — works and travels at speeds to 19 mph.

All these machines are equipped with high-speed electric controls. A flick of a fingertip switch and you get instant action, right now! There is no engaging of a clutch or waiting for hydraulic pressure build-up.

Other "plus" speed features help cut seconds, even minutes, off each work cycle. These include electric power steer, short turning radius (only 12'8" for the "D" and 15' for the "C"), and power-proportioning differential which transfers 80% of the tractive effort to wheel on firmest footing.

All these savings in time result in lower costs when multiplied over the duration of the job. They help you move more dirt per hour, complete each job faster, handle more jobs per season.

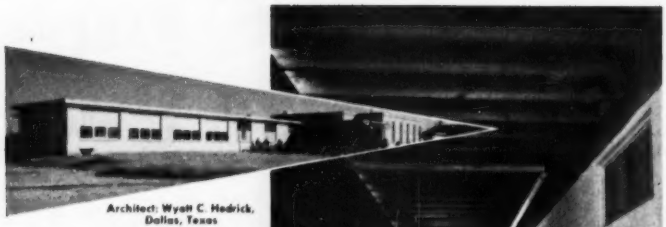
Put yourself in the best possible competitive position by replacing your worn-out, obsolete equipment with modern, electric-control machines.

Get all the facts and then compare. You'll soon see why LeTourneau-Westinghouse owners have the best insurance for jobs and profits when competition gets tough!

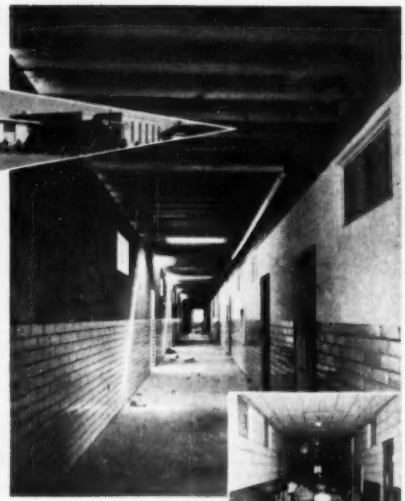
Tournapull—Trademark Reg. U.S. Pat. Off.
Tournatractor—Trademark G-505-G

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS



Architect: Wyatt C. Hedrick, Dallas, Texas



Four Longview school buildings used approximately 400,000 fbm of Minalith-treated lumber for roof decks, ceiling joists, wood framing around openings.

How Longview, Texas, PROTECTS Its School Children and Its Tax Dollar Investment

When the citizens of Longview, Texas decided their community needed four new school buildings, they demanded absolute structural safety plus practical economy of design and construction. They also wanted long serviceability with minimum maintenance.

Wyatt C. Hedrick, well-known Dallas architect suggested a popular and economical method of construction—brick veneer supported by fire-retardant chemical-impregnated lumber.

Hedrick specified that lumber be pressure impregnated with Minalith.* Listed by Underwriters' Laboratories, Minalith also meets Federal Specifications for Fire Retardants. Wood treated with Minalith will not support combustion—it will char slowly where flame touches it, but will not ignite. During a fire, Minalith-treated lumber maintains its load bearing strength without sudden collapse. As a plus-value, Minalith protects wood from decay organisms and insect attack. And Minalith has no undesirable effects on lumber, keeps it clean for handling and completely paintable.

With Minalith-treated lumber readily available, local labor was able to proceed at once. Longview was pleased to note that use of local labor and local materials kept construction tax dollars at home.

Minalith-treated lumber is a product of American Lumber and Treating Company, who also produce Wolmanized* preservative-treated lumber. There are Wolman preservative treatment plants in all parts of the country. For further information write:

American Lumber & Treating Company

General Offices: **1601 McCormick Building, Chicago 4, Illinois**

Offices: Little Rock, Arkansas • Portland, Oregon • Boston • Los Angeles San Francisco • Baltimore • New York • Jacksonville, Florida • Seattle

Producers of the Original

MINALITH *FLAME PROOFED LUMBER*

a companion product to **Wolmanized** PRESSURE TREATED Lumber

* Reg. U. S. Pat. Off.

MUNICIPAL

Phoenix water

City's 50-year program has supply to exceed need

The first phase of a 50-year plan to keep water supply for the city of Phoenix, Ariz., ahead of demands has passed the half-way point.

The city is spending more than $5 million on projects to step up its supply and delivery system.

Chief items under construction are a $2-million filter plant at Squaw Peak on the city's outskirts, a $347,670-expansion of present filter treatment facilities at Granite Reef Dam on the Verde River (ENR, May 26, 1949, p. 47) and a $2,457,020-pipeline from the Squaw Peak plant to the city distribution network.

• **Big pipe**—The pipeline will consist of the biggest pipe in the state—a reinforced concrete tube 5½ ft in dia. This main feeder will taper to 24 in. at its farthest point. From this will branch feeder mains to equalize pressure at the desired high level during the summer's peak-use months.

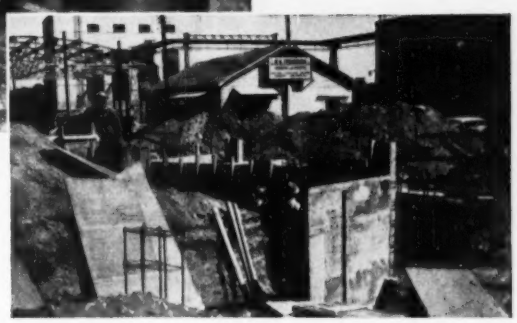
The water program is part of a 10-year portion of the 50-year plan worked out by the engineering firm of Headman, Ferguson and Carollo. Their plan anticipates city water needs to the year 2,000.

Phoenix last year approved a $7-million bond issue to handle first phases. Half the bonds were sold last September, another $2.5 million will be sold later this year and the remaining $1 million is scheduled to be sold next year.

The Phoenix system soon will be serving about 200,000 persons through

BIGGEST VALVE (66 in.) in the Salt River Valley—Squaw Peak pipeline.

Cutting plywood on the same DELTA Radial Saw that cuts all wood on the job site.



Workmen place concrete forms for the $5 million tube mill built by the H. K. Ferguson Company. All forming on the job was cut with a DELTA Radial Saw.

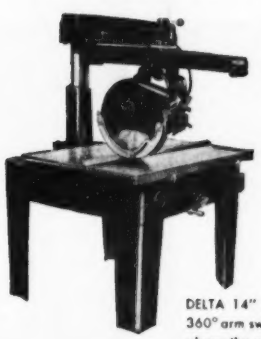
"DELTA'S Ease of Handling Steps Up Production

that's what H. K. Ferguson Co. says about the DELTA Radial Saw

Eight hours a day, seven days a week, a DELTA 14" Radial Saw constantly rough and bevel cuts plywood, pine, birch, and oak at Bridgeport Brass Company's new $5 million tube mill being constructed by the H. K. Ferguson Company. "Real production increases developed immediately," reported James Thompson, veteran carpenter . . . . . ."I've handled every radial saw on the market in my 49 years as a carpenter, and DELTA is the easiest machine I've ever used. We used to think radial saws were clumsy and awkward to operate, but there's nothing awkward about a DELTA. DELTA's ease of handling means stepped up production. The simple adjustments enable us to move quickly from one cutting operation to another. And, the controls are right there in front of you; you don't have to go looking for hidden cranks and guides.

"A DELTA will really take punishment, too," says Mr. Thompson. "You don't baby a saw on a construction job like this, and we've had no maintenance . . . no trouble at all."

Find out now how DELTA Radial Saws can help you cut costs on any construction job. Send the coupon today for full information and the name of your nearest DELTA Dealer.



DELTA 14" Radial Saw with exclusive 360° arm swing lets you make every cut above the work table...quickly...safely.

DELTA MILWAUKEE

DELTA QUALITY MAKES THE DIFFERENCE

DELTA QUALITY POWER TOOLS

Another Product of **Rockwell**

Delta Power Tool Division
ROCKWELL MANUFACTURING COMPANY
688M N. Lexington Ave., Pittsburgh 8, Pa.

☐ Please send Delta Radial Saw catalog.
☐ Please send name of nearest Delta Dealer.

Name .....

Address .....

City ..... Zone ..... State .....

WATER Paces Lakeland's Business Growth!

Allis-Chalmers Helps World's

THE "WORLD'S CITRUS CENTER" is being helped by Allis-Chalmers in the race to keep water works ahead of population growth. In ten years, Lakeland's population has increased 70 percent, meters have doubled, and gallonage pumped has nearly tripled!

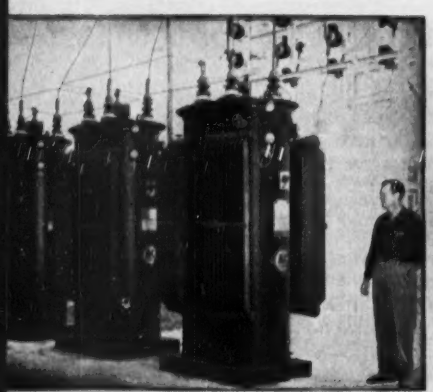
Lakeland is so named because of the 12 lakes within its city limits. It is near the geographical center of Florida, in Polk county . . . producer of a third of all Florida citrus, two thirds of U. S. phosphate, and more cattle than any other county in the state.

Lakeland gets its water — 154,363,500 gallons per month average in 1952 — from 11 deep wells running down to 1201 ft in depth. Storage capacity is 1,778,000 gallons. Following aeration, Allis-Chalmers pumps . . . driven by Allis-Chalmers motors . . . using Allis-Chalmers generated power . . . force the water into the city mains.

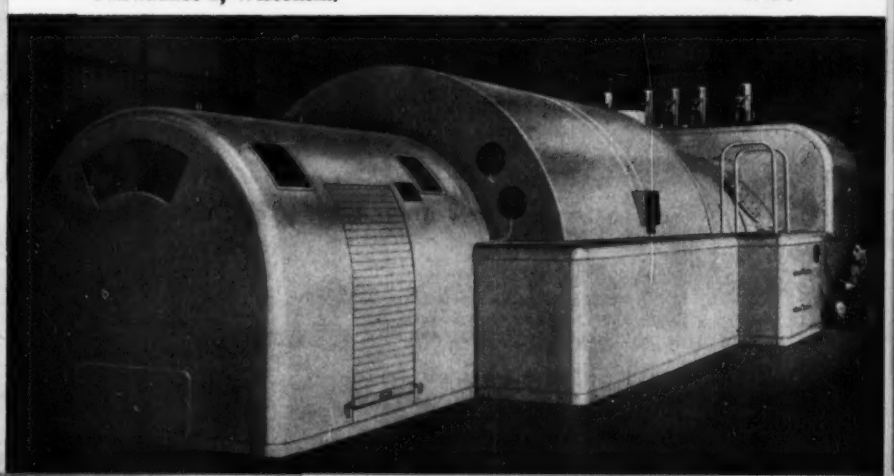
Lakeland has learned by experience the wisdom of depending on Allis-Chalmers for a complete range of public works equipment. Some of their A-C equipment has been in operation for over 30 years and maintenance has been "practically nil." A-C equipment at Lakeland ranges from three turbine-generators through transformers, M-G sets, and controls to motors and pumps of many sizes.

When *your city* plans expansion or modernization, do as Lakeland and other leading cities are doing — take advantage of Allis-Chalmers experience as builder of the world's widest range of public works equipment. Literature on all products available; Public Works Bulletin 25C6607A and Pump Bulletin 08B6146B just off the presses. For your copies, just call your nearest A-C sales office or write to Allis-Chalmers, Milwaukee 1, Wisconsin.

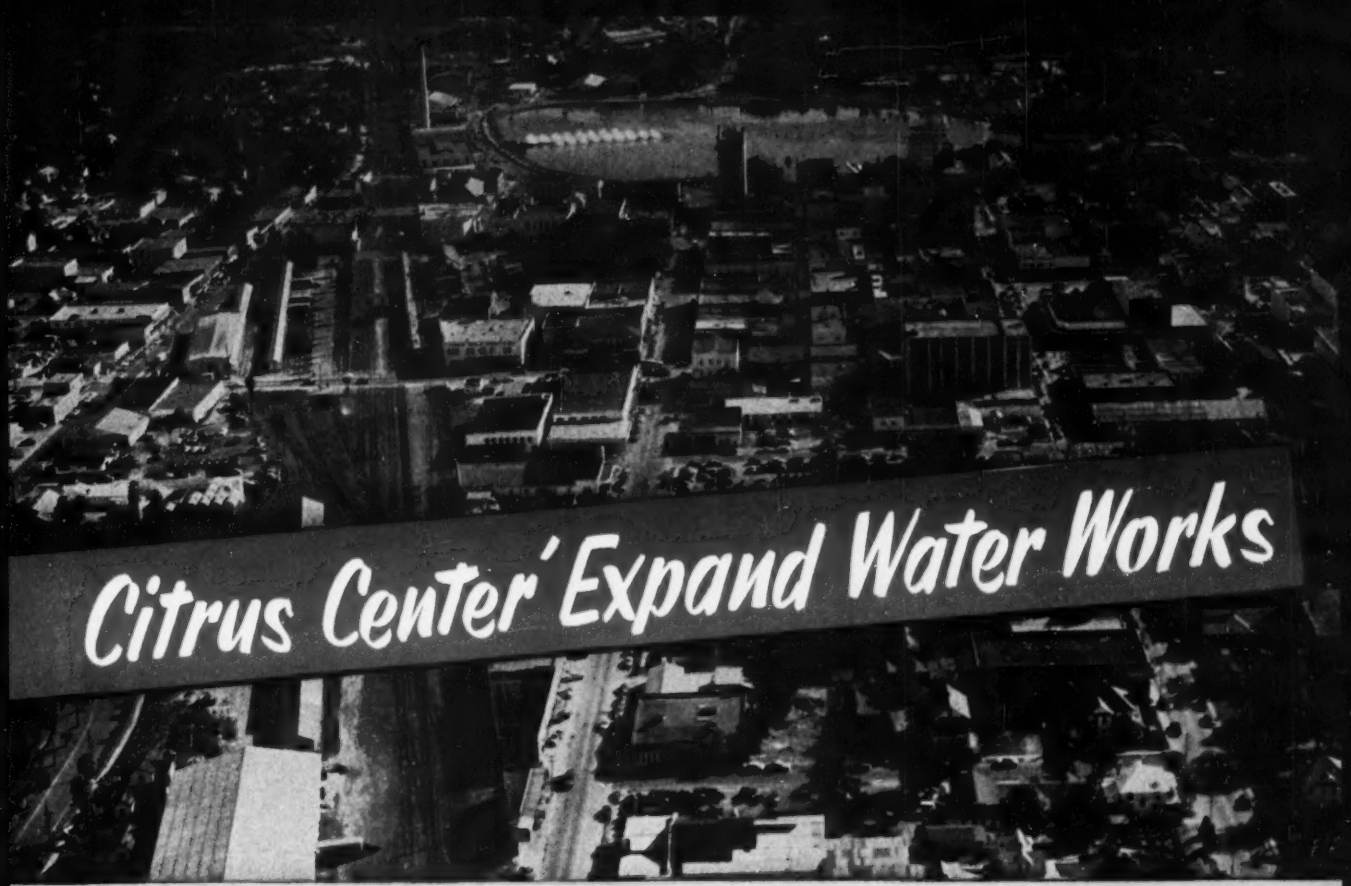
A-4070



POWER TRANSFORMERS were furnished by Allis-Chalmers. Those above are 833 kva, single phase, self-cooled units in Lakeland suburban substation. Other electrical equipment supplied includes controllers for the 150 hp deep well pump motors.



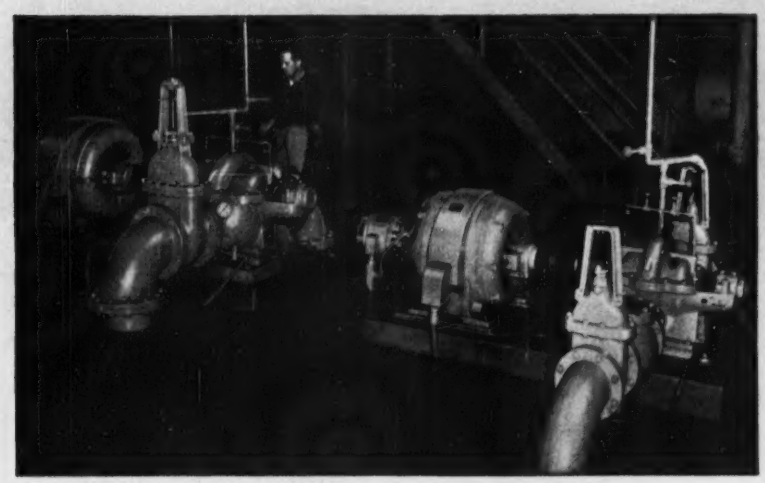
NEW POWER HOUSE features Allis-Chalmers 20,000 kw steam turbine generator unit. In addition to the steam turbine, hydrogen cooled generator, main and pilot exciters, and hydrogen control equipment, A-C also furnished the three 6 x 4 in., 450 gpm, 1150 psi boiler feed pumps.

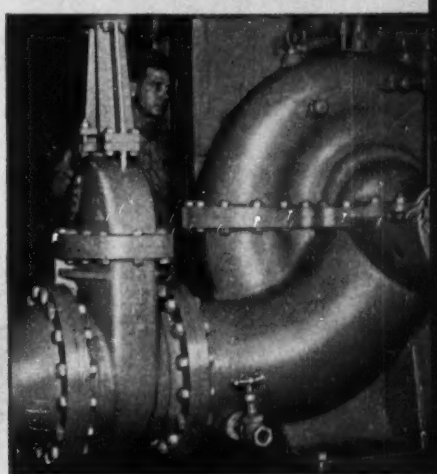


Citrus Center Expand Water Works

LAKELAND FROM THE AIR, looking east. Over 600,000 people live in a 50 mile radius from Lakeland, Fla. Old power house, containing two Allis-Chalmers 5000 kw steam turbine generator units and associated equipment, is on left shore of Lake Mirror in center of above photograph.

CITY MAINS ARE SUPPLIED by Allis-Chalmers pump-motor teams ranging in capacity from 2000 to 4000 gpm each. Typical setup shown below: at left is a 12 x 10 in. pump rated 4000 gpm at 160 ft head, driven at 1800 rpm by 200 hp motor. At right is a 2000 gpm, 8 x 8 in. pump driven by a 100 hp, 1800 rpm synchronous motor.





PUMPS RANGE IN SIZE from 1¼ x 1¼ in. to this 16 in., 6000 gpm, 16 ft head unit furnishing condenser cooling water in old power house. Here Allis-Chalmers supplied two 5000 kw steam turbine generator units, boiler feed and condenser circulating water pumps, and crane motor-generator set.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

Builders of the World's Widest Range of Public Works Equipment

BRIDGING THE COUNTRY

THE SUPERIOR BRIDGE DECKING FOR SMALL OR LARGE JOBS

★ 80% OPEN
★ SELF-CLEANING
★ SELF-DRAINING
★ NON-FLOAT
★ NOT AFFECTED BY WIND PRESSURE
★ LIGHT WEIGHT
★ STRONG, SAFE ROAD SURFACE
★ MINIMUM OF ROAD MAINTENANCE

IRVING DECKING

"A BRIDGE IS ONLY AS GOOD AS ITS DECK"

- Also gratings for bridge sidewalks and gutter catch basins.
- No accumulation of dirt or snow.
- For further information and engineering data ask for catalog.

IRVING SUBWAY GRATING CO., INC.
ESTABLISHED 1902
OFFICES and PLANTS at
5063 27th St., Long Island City 1, N. Y.
1863 10th St., Oakland 20, California

50,000 connections, with the present 10-year phase designed to meet the needs of 296,000 persons through 65,800 connections by 1962.

• **Filter plant**—The new Squaw Peak filter treatment plant will have an output of 30 mgd taken from the Arizona Canal, part of the Salt River Valley Water Users Assn irrigation system.

Use of the canal eliminates need for another costly pipeline from the Granite Reef area where the city now picks up its water supply.

This independent source of water would minimize the seriousness of a possible break in the present line from the Verde River.

Capacity of the Squaw Peak plant can be boosted to 40 mgd if necessary. This would be sufficient to handle the city's requirements during other than peak summer months—normal summer use is 80 mgd.

T.K.G. Construction Co. is building the filter plant. Water taken from the canal will be allowed to drop the heavier sand and clay in a presedimentation basin on the level of the canal, then it would be pushed from a pumping station to a five-story chemical building for treatment. Taking on alum, fluorine and carbon in four hoppers each with a capacity of two carloads of aggregate, the water will drop down into flash mixers, coagulation and sedimentation basins, and finally will be stored in a 20-million gallon reservoir for final delivery through the 66-in. pipeline system.

Above the filter plant is a 1-million gallon steel wash water tank that will be used to backwash the eight filter units.

At the present city facility, above Granite Reef Dam where the Verde River joins the Salt River, Fisher Contracting Co. is building an additional presedimentation basin and pumping station that for the first time will enable the city to take water from the Salt River—the water of which requires more chemical treatment than that of the Verde, but the Salt River will be a desirable addition when the Verde source is low. This project, plus work on the present Granite Reef filter plant will increase capacity there by 10 mgd.

Permanent pavement markers will be tried in Milwaukee

The city of Milwaukee, Wis., is starting tests of three new types of pavement marking materials in an attempt to find a method that will eliminate the constant repainting of

5000 C. P. PORTABLE KEROSENE BURNING

FLOODLIGHT PROJECTORS

For Night Lighting

Widely used by contractors, municipalities, industrial plants, railroads, armed forces, and park districts

• *Absolutely weatherproof.* Burns for 40 hours on 8 pints of kerosene—also burns #1 Diesel Oil. Gives a white light of 5000 c.p. and throws a beam about 150x75 ft. A fine light to have especially in emergencies when power is not available. Model F. L. 8 (left) is mounted on a 5 to 8 foot telescopic tripod with revolving base and weighs 60 lbs.—$98.00 F.O.B. Chicago. The model below is mounted on a short stand and weighs 38 lbs.—$72.50 F.O.B. Chicago.

Specifications

Projector dimensions — 14½" wide — 11½" deep — 26" high
Dia. of Reflector....14"
Center of Refl. above ground—short stand..18"
Center of Refl. above ground—tripod stand 8' max. 5' min.
Weight of Projector without oil....22 lbs.
Weight of Projector with oil....28 lbs.
Weight of short stand....5 lbs.
Weight of tripod stand....34 lbs.
Capacity (sufficient for about 40 burning hours) 6 pts.

• INSPECTION LAMP
Model AL-21

Excellent for use in confined spaces as a hand inspection lamp or as a small floodlight. Overall dimensions 8x8x 11-½"—weight 7-½ lbs.—dia. of Refl. 7"—oil capacity 1-½ pints—will burn 12 hours and gives a 2000 C.P. reflected light.
$36.00 F.O.B. Chicago.

WRITE FOR DETAILS

Let us send you descriptive circulars of our floodlight projector and inspection lamp.

WM. W. LEE and SON
20 EAST JACKSON BLVD.
CHICAGO 4, ILLINOIS

pavement dividing strips and lane markers.

All materials to be tested will be imbedded in pavement and are claimed to be permanent. While strips of paint can be applied to pavement at a cost of about five cents per foot, the new markers cost as much as $1.50 per foot. Some city traffic and street officials, however, believe the cost over a period of years would not be any higher than that of the old method, if the materials prove successful.

The markers to be tested are:

- An asphalt product that is heated and poured into channels gouged in the pavement;
- A precast slab of white concrete containing reflecting pebbles to be used on asphalt streets only;
- And an asphalt material which is used for a black line on concrete pavements and can be given different colors by addition of hued chips in the mix. The manufacturer says the chips also will impart non-skid qualities.

Multiple housing code shaped in conferences

The New York State Building Code Commission announced that it would conduct hearings Dec. 2 and 3 in Albany and New York City, respectively, on a state Building Construction Code that will be applicable to multiple dwellings.

The code, in its earlier drafts, has been subjected to intensive study and criticism by scores of engineering authorities and technical committees.

Conferences attended by more than 800 municipal officials and others were held throughout the state last spring in order to obtain a "grass roots" criticism of the tentative draft available at that time. Considerations in code drafting developed at these conferences are reflected in the final draft, according to a commission spokesman.

Treatment plant assured—long squabble terminates

San Jose, the last sizable community still dumping raw sewage into San Francisco Bay, finally will get the primary treatment plant its officials approved nearly four years ago.

Plans and specifications for the long contested $3-million plant were approved recently by the city council, and City Engineer Harold J. Flannery has applied for a building permit from the town of Alviso, where the plant will be located. Bids will be advertised as soon as the permit is granted.

The original San Jose plant, de-

Need a Low Cost Permanent Building
QUICKLY?
. . . include
STEELCRAFT
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MUNICIPAL

signed by consulting engineers C. G. Hyde and G. L. Sullivan, called for a secondary treatment plant with five oxidation ponds on the marshlands. But the city lost a suit to condemn 2,500 acres, most of which belong to Leslie Salt Co., which uses the land to produce salt from the bay by evaporation (ENR Nov. 22, 1951, p. 47).

As yet, San Jose has no alternate secondary treatment plan. It could reopen its suit against Leslie Salt, since the judge ruled "without prejudice." Or it could discharge the primary-treated effluent into the bay at some point determined to be safe. The city's particular problem results from wildfire industrial expansion and seasonal peaks of waste from canneries.

Flannery's office is conducting a series of investigations in cooperation with the State Water Pollution Board and the Fish & Game Commission to determine the extent of bay pollution and to calculate the receiving power of the bay.

Municipal briefs . . .

• **Water plan**—A $22-million plan for water main construction has been submitted to Chicago officials. Public Works Commissioner Gunlock said the new mains would provide adequate terminals along the city limits from which the suburbs may make additional connections at their own expense. It is estimated that since it started pumping 100 years ago, the Chicago system has cost $235 million.

• **Eau Claire, Wis.,** has dedicated a new $270,000 multi-level self-parking ramp garage. The project was financed through revenue bonds backed by income derived from parking meters.

• **Maryland cities take note**—The Maryland Water Pollution Control Commission has released a notice of change in the commission's Regulation IV. Copies are available at the commission office at 2114 N. Charles St., Baltimore, 18, Md.

• **Bond sale**—The common council of Bedford, Ind., has passed an ordinance authorizing the issuance of $1.9 million in sewage works revenue bonds. They will be offered on Nov. 30.

• **Green light after four years**—Years of legal battling climaxed by five appeals to the Florida Supreme Court seem to have cleared the way for construction of a 3,000-seat auditorium at Pensacola, Fla. City councilmen have awarded a general construction contract to Dyson and Co.

tunnels to towers

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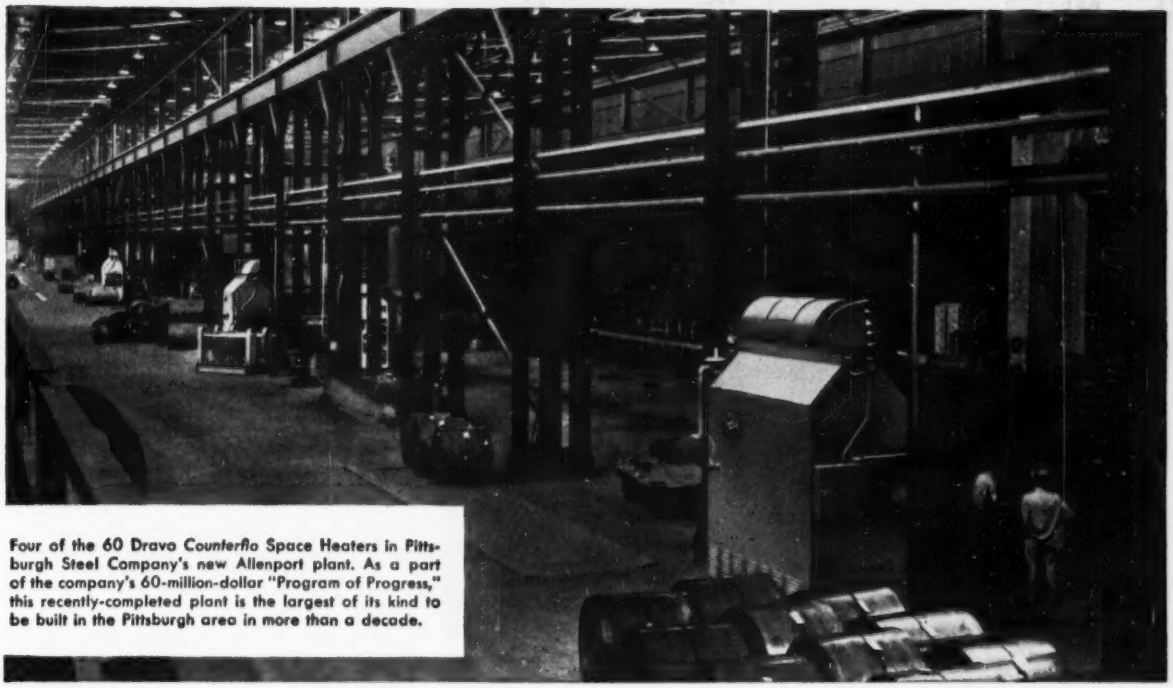

Four of the 60 Dravo *Counterflo* Space Heaters in Pittsburgh Steel Company's new Allenport plant. As a part of the company's 60-million-dollar "Program of Progress," this recently-completed plant is the largest of its kind to be built in the Pittsburgh area in more than a decade.

60 DRAVO *Counterflo* SPACE HEATERS INSTALLED AT PITTSBURGH STEEL'S NEW ALLENPORT PLANT

To provide comfort heat in winter and ventilation in summer Pittsburgh Steel Company has installed 60 Dravo *Counterflo* Space Heaters at its new hot strip and cold rolled mills in Allenport, Pennsylvania. The positioning of these heating units in large steel-processing areas within the plant assures "uniform heat" when and where it is needed without distribution loss or costly steam piping installations.

Pittsburgh Steel chose Dravo *Counterflo* Heaters for three reasons:

FUEL ECONOMY. Heat is generated only where and when it is needed; no long warm-up period is required. Heat is transferred quickly and efficiently through the floating stainless steel combustion chamber to the circulating air. Dravo *Counterflo* Heaters operate at better than 80% efficiency.

EFFICIENT AIR DISTRIBUTION. Because of maximum air-throw it was possible to install the Dravo *Counterflo* Heaters in out-of-the-way places along the building column line. Final positioning of the adjustable outlet nozzles on each heater assures uniform distribution of heat throughout the area served. Heater fans provide good ventilation during hot summer months.

MINIMUM OF MAINTENANCE. With few working parts, Dravo *Counterflo* Heaters require a negligible amount of maintenance. The 60 heaters work automatically; no full-time attendent is required. Each heater has a combination burner that uses either gas or oil for fuel.

These are just a few of the advantages that Dravo *Counterflo* Space Heaters can offer you. Write today for more information. Use the coupon.

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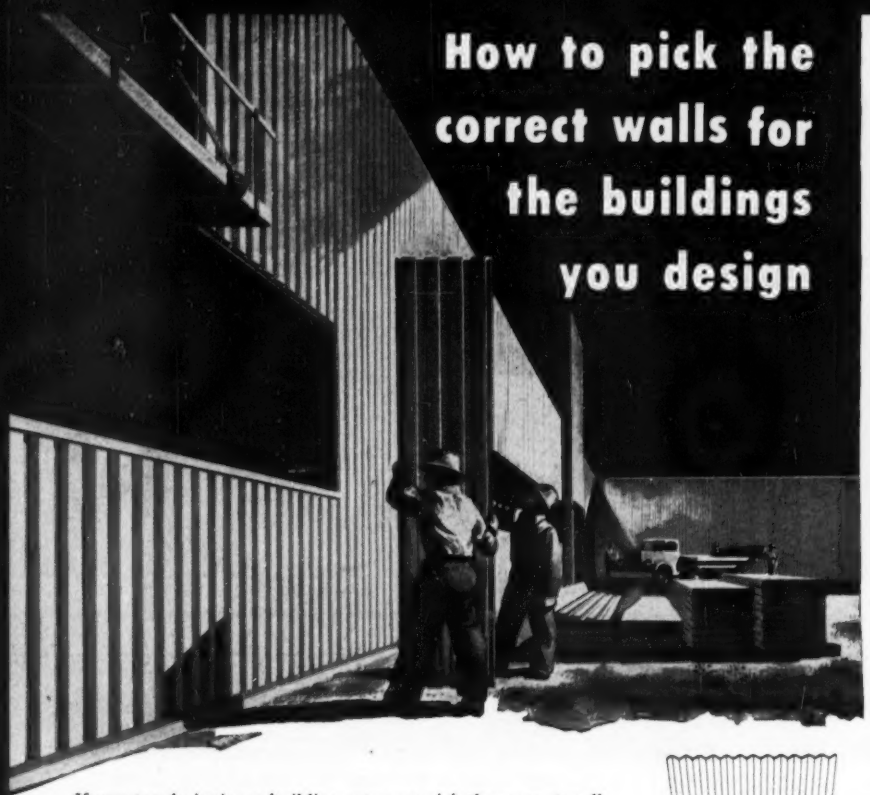


How to pick the correct walls for the buildings you design

If you are designing a building, you can pick the correct wall by matching the function of the structure against the Robertson Q-Wall products shown here. These modern walls save construction time and money and give many extra years of maintenance-free service. They can be demounted and reused to keep pace with plant expansion. Q-Walls weigh less than 1/16th of the equivalent masonry wall.

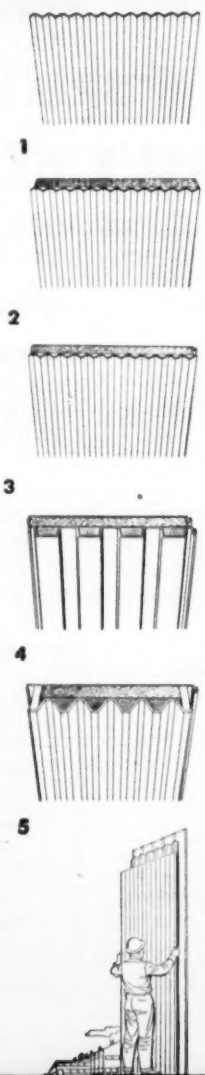
1. Galbestos. Ideal for standard industrial plants. Galbestos has the highest resistance to corrosion and weather of any protected steel siding or roofing you can specify. For mill buildings, warehouses, or any other industrial structures that do not require full insulation.

2. Insulated Galbestos. Perfect for a dry-occupancy industrial building that must be heated. Non-combustible insulation is installed on the job by the Robertson *Top-Speed* fastening method, and Galbestos applied over. Its heat transmission factor (U-Value) is 0.16 BTU per sq. ft. per hr. per degree of temperature difference, F.

3. G-Type Q-Panels. This is a *field-assembled* wall made up of an interior steel vapor barrier, a layer of incombustible insulation, and an exterior of tough, long-lasting Galbestos. The proper combination for an industrial situation which requires both temperature and humidity control. U-Value—0.16 BTU.

4. Q-Panels. A quickly erected, *factory-assembled* panel combining strong, dry, lightweight construction with architectural beauty. Well adapted to air-conditioned buildings of all sizes, and obtainable with various exterior surfaces, either metal coated steel, stainless or aluminum. U-Value—0.16 BTU.

5. H-Type Q-Panels. Differ from standard Q-Panels essentially in that they contain twice as much insulation. Ideal for cold storage warehouses, refrigeration plants and structures subjected to Arctic conditions. U-Value is 0.08 BTU. Write for complete details.



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BOOKS

New engineering books

THE THEORY AND PRACTICE OF REINFORCED CONCRETE—Third Edition. By Clarence W. Dunham. 499 pp. McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. $7.00.

EARTH PRESSURE CALCULATION—By Jorgen Brinch Hansen (with summaries in English and Danish). 271 pp. Danish Technical Press, Engineering House, Copenhagen V, Denmark. $4.30.

POPULATION PROBLEMS—Fourth Edition. By Warren S. Thompson. 488 pp. McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. $6.50.

AUTOMATIC CONTROL OF HEATING AND AIR CONDITIONING—By John E. Haines. 370 pp. McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. $6.75.

PIPEFITTERS HANDBOOK—By Forrest R. Lindsey. 282 pp. The Industrial Press, 148 Lafayette St., New York 13, N. Y. $6.00.

PIPE AND TUBE BENDING—By Paul B. Schubert. 183 pp. The Industrial Press, 148 Lafayette St., New York 13, N. Y. $5.00.

Reports and pamphlets

AMERICAN STANDARD SPECIFICATIONS—A21.2 (1953) Cast Iron Pit Cast Pipe (45¢); A21.4(1953) Cement Mortar Lining (35¢); A21.6(1953) Centrifugal Cast Pipe, Metal Molds (40¢); A21.8 (1953) Centrifugal Cast-Pipe, Sand-lined Molds (45¢); A21.11(1953) A Mechanical Joint for Cast Iron Pressure Pipe (35¢). American Water Works Association, 521 Fifth Ave., New York 17, N. Y.

PARKING AUTHORITIES—The Eno Foundation For Highway Traffic Control, Saugatuck, Conn. Limited free distribution.

STRENGTH, SAFETY AND ECONOMICAL DIMENSIONS OF STRUCTURES—The Division Of Building Statics And Structural Engineering At The Royal Institute Of Technology, Stockholm, Sweden.

AN INVESTIGATION OF THE PERFORMANCE OF SIX SMALL SEPTIC TANKS—Bulletin Series No. 409, University Of Illinois Engineering Experiment Station, Urbana, Ill. 60¢.

A MULTITUDE DIFFERENTIAL PRESSURE MANOMETER FOR MEASURING THE AVERAGE FLOW OF FLUIDS IN CLOSED DUCTS—Bulletin Series No. 410, University Of Illinois Engineering Experiment Station, Urbana, Ill. 30¢.

WOOD PRESERVATION—Bulletin 174, Iowa Engineering Experiment Station, Ames, Iowa.

SOME ECONOMIC EFFECTS OF HIGHWAY IMPROVEMENT—Bulletin 67, Highway Research Board, Washington 25, D. C.

ALBUQUERQUE MOVES FORWARD—An Appraisal of Progress in the Attack on the Traffic Problem. Automotive Safety Foundation, Washington 6, D. C. Copies available from the City Manager, Albuquerque, N. M.

OBITUARIES

Vernon K. Hoffner, 76, died Nov. 16 in Cleveland, Ohio. From 1902 to 1942 he was in the engineering department of the New York Central System. When he retired in 1942 he was assistant chief engineer of construction. After his retirement, he worked for Arthur G. McKee & Co. for six years.

George Partridge, 67, construction engineer with the Bureau of Engineering, San Francisco Department of Public Works, died Nov. 12. He was resident engineer for several large construction projects, including the $6.1-million Broadway Tunnel. Partridge joined the bureau in 1928 as an inspector.

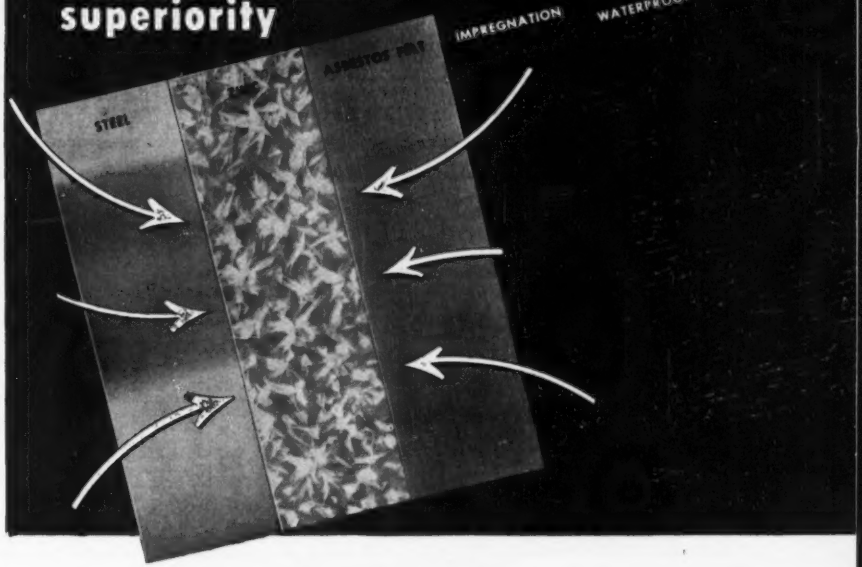
W. G. McConnel, 84, civil engineer and former president of the Sao Paulo tramway, power and light company in Brazil, died at Stamford, Conn., Nov. 22. He laid out the grounds for the Worlds Columbian Exposition in Chicago, 1893, and he supervised the building of the first section of the Illinois drainage canal through Chicago. He later did engineering work in Alaska, Cuba and Brazil.

Harry Southard, 62, former city civil engineer at Indianapolis, died Nov. 15 in that city. He was graduated from Purdue University in 1914, and was with the city engineering department for 30 years.

Australian hydro review: costs found too high

The expected cost of Australia's vast Snowy Mountains hydroelectric scheme (ENR February 5, 1953 p. 58) has gone up from the estimated figure of $450-million in 1949, when the program was launched, to $1.2-billion. This startling jump in the overall cost of the project was revealed at a recent meeting of Australian Commonwealth State ministers. At the meeting the state governments of New South Wales and Victoria insisted on a full examination of costs before they entered any agreement with the commonwealth to buy the Snowy Mountains power. The original plan called for New South Wales to buy two-thirds of the power and for Victoria to buy the remainder. The two states want the right of veto over construction costs in order to keep down the cost of power.

How molten metal helps give Galbestos its superiority



Robertson Galbestos has the greatest resistance to weather and corrosion of any protected steel roofing or siding obtainable anywhere. This position of broad superiority is made possible by a unique manufacturing process exclusive with H. H. Robertson Company.

First, the steel sheet is pickled . . . then given a coating of molten zinc. Asbestos felt is then pressed on so that as the molten metal hardens in cooling it grips the felt fibers in absolute bond. The asbestos is then impregnated with a special asphaltic compound and, finally, given a tough weatherproof coating. Galbestos can be furnished flat or in the 3 well-known corrugations: Standard, Mansard, and V-Beam. The resultant material is so durable, it may be sheared, bent, rolled, crimped and riveted in the field as easily as ordinary unprotected steel. It will withstand the greatest possible extremes in weather temperatures without deterioration, and will actually retard fire better than naked steel. For an industrial roofing or siding that requires no maintenance under the most severe corrosive conditions, specify Galbestos.

Long Service Life. Galbestos will give longer maintenance-free service under the most severe weather and man-made corrosive conditions. Even salt air cannot penetrate its tough coatings to destroy the steel core.

Not Fragile. Galbestos' strong steel core sheet guarantees against breakage—during shipment or during erection.

Resists Climatic Extremes. Galbestos is not subject to damage either by tropic or frigid temperatures. Its coatings will not run under broiling sun or crack or spall in sub-zero weather.

Goes Up Fast. The exclusive Robertson *Top-Speed* method of attaching Galbestos to structural steel speeds up erection for quicker occupancy.

Resists Flame. Leading testing laboratories have made exhaustive tests on the fire resistance of Galbestos and have published the results. Copies of these reports are available for study.

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M E SCIORRA, F S. DEMBEK, Reports.
J. H. WEBBER, M R. ROESSLER, E R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† **R. I., Davisville**—B.A. 12/10—P. Wks. Office, 495 Summer St., Boston, Mass., storm drainage imprvs. and equipment washing apron, U. S. Naval Construction Battalion, NOY 81078, Spec. 40102. Plans deposit $10. CD 9/12/52, under Public Buildings.

† **R. I., Newport**—STEAM LINES—B.A. 12/15—P. Wks. Office, First Naval Dist., 495 Summer St., Boston, Mass., steam transmission lines, U. S. Naval Hospital and U. S. Naval Station, NOY 79736, Spec. 38264. Plans deposit $30.

† **R. I., Quonset Point**—SEWERS—B.A. 12/15—P. Wks. Office, First Naval Dist., 495 Summer St., Boston, Mass. (1) 8,350 lin. ft. 14 in. c.i. and cement asbestos pipe main (2) reconstr. pumping station with masonry walls and precast concrete plank roof, etc. (3) glass enclosure on concrete fdn. for existing open sludge drying bed and hoist rail, hoist and bucket will be installed (4) rein.-con. sludge digestion tank with rigid cover and control bldg., U. S. Naval Air Station, NOY 77833, Spec. 38255. Plans deposit $40. CD 10/31/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Ralph Richard Co., 17 Poplar St., Roslindale, Mass. LB $170,593, est. $180,000. furnish, lay water pipes vicinity of and on Hunts Falls Bridge, Lowell, MASSACHUSETTS. Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Mass. Bids Nov. 17. CD 11/5.

MASACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

William P. Capone Corp., 25 Hillock St., Roslindale, Mass. LB $140,573, est. $156,000. hy. work, Chestnut Hill Ave., Brighton. Bids Nov. 17. CD 11/5.

† **Platt Constr. Co., Inc.**, 99 First St., Cambridge, Mass. CA $776,000, est. $500,000. airmen's dormitory, mess and admin. bldg., Hanscom Air Force Base, Eng. 19-016-54-34-2, BEDFORD, MASS. U.S. Eng., B57 Commonwealth Ave., Boston, Mass. CD 10/28, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Brown Constr. Co., 562 Congress St., Portland, Me. LB $430,137, est. $300,000. Lyman Moore Elementary SCHOOL, Allen Ave. and Summit St., PORTLAND, ME. City, Dr. Harrison C. Lyseth, supt. Schools, City Hall, Portland, Me. Bids Nov. 17. CD 11/6.

John Capobianco, 44 School St., Boston, Mass. CA Est. $500,000. BAKERY addn., WORCESTER, MASS. Table Talk Pastry Co., Inc., 153 Green St., Worcester, Mass. Bids Nov. 4. CD 11/4.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

† **Md., Annapolis**—DAHLGREN HALL—B.A. 12/15—P. Wks. Office, U. S. Naval Academy, Annapolis, alterations, addns. Dahlgren Hall, Bldg. No. 103, U. S. Naval Academy, NOY 79372, Spec. 39729. Plans deposit $20.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Colmar Constr. Co.**, 364 Gold St., Brooklyn 1, N. Y. CA $1,869,000. general reconstr. new Junior HIGH SCHOOL 263, Chester and Bristol Sts. between Blake and Sutter Aves., BROOKLYN, N. Y. Director Bureau Constr., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Oct. 26. CD 11/10, under LB.

Met Constr. Corp., 50 Court St., Brooklyn 2, N. Y. CA $675,000. P. S. 93 SCHOOL, BROOKLYN, N. Y. Bd. Educ., Director Bureau Constr., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Oct. 21. CD 10/28, under LB.

Planet Constr. Co., 11 W. 42 St., New York 36, N. Y. CA $614,000. P. S. 22 SCHOOL, Forest Ave. and Sanders St., MARINERS HARBOR (Sta. Staten Island), N. Y. Bd. Educ., Director Bureau Constr., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Oct. 8. CD 10/28, under LB.

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 2, N. Y. CA $1,416,000. P. S. 191 SCHOOL, E. 148, Amsterdam Ave., 60 and 61 Sts., Manhattan Boro, NEW YORK, N. Y. Bd. Educ., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Nov. 6. CD 11/10, under LB.

▲ **M. W. Kellogg Co.**, 225 Broadway, New York 7, N. Y. CA. Est. $12,000,000. crude DISTILLATION UNIT to process 12,000 bbls. daily, ROUSEVILLE, PA. Pennzoil Co., Drake Theatre Bldg., Oil City, Pa. River, Elkhart Co.;

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **S. C., Charleston**—DISPENSARY—B.A. About 1/2—U. S. Eng., Custom House, dispensary at Charleston Air Force Base, North Charleston, Eng. 38-081-54-10. CD 11/14/52.

BIDS ASKED—BUILDINGS

▲ **N. C., Morganton**—HOSPITAL, etc.—B.A. 1/12—State of North Carolina, Capitol, Raleigh, hospital and admissions bldg., at State Hospital. $1,000,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Guy Lewis, McLean, Va., CA $209,625, constr. culvert over Hooffs Run at Prince St., ALEXANDRIA, VA. P. Wks. Office, City of Alexandria Court House, Alexandria, Va. Bids Nov. 5, awarded Nov. 17. CD 11/11, under LB.

Williams Bros. Co., National Bank of Tulsa Bldg., Tulsa, Okla., CA $750,000, natural gas lines, HENDERSONVILLE, N. C. Public Service Co. of North Carolina, c/o contractor.

† **Southern Constr. Co.**, Daniel Field, Augusta, Ga., LB, $768,249, administration and headquarters bldg., Warner Robins Air Force Base, Inv. 54-10, MACON, GA. U. S. Eng., 200 E. St. Julien St., Savannah, Ga. Bids Nov. 15. CD 10/14.

† **Brinson Constr. Co.**, P. O. Box 2209, Tampa, Fla., CA, $164,300, dredging St. Johns River ship channel, Jacksonville, FLORIDA, U. S. Eng., 575 Riverside Ave., Jacksonville, Fla. Bids Nov. 13.

Hammond Iron Works, Warren, Pa., LB, $100,590 water tank, ST. PETERSBURG, FLA. City, City Hall, St. Petersburg, Fla. Bids Nov. 10. CD 10/29.

▲ **ALABAMA**—State Hy. Dpt., Montgomery,

Hewitt Contg. Co., P.O. Box 1372, Columbus, Ga. CA, $1,051,987, Proposal A, grading, drainage 7.699 mi. from Brompton toward Eden, I.F.I. 164 (4) St. Clair Co. Bids Oct. 30. CD 11/12, under LB.

† **Airport Constructors**, Lake Charles Airbase, Lake Charles, La. LB $275,316, east-west runway overlay, Lake Charles Air Force Base, Inv. 54-28, LAKE CHARLES, LA. U. S. Eng., P.O. Box 1229, Galveston, Tex. Bids Nov. 13. CD 10/21.

Boh Bros. Constr. Co., 2400 Cypress St., New Orleans, La. CA $79,424. Proposal No. 7381, c.conc. Loyola Ave., etc. NEW ORLEANS, LA. City, City Hall, New Orleans, La. Bids Nov. 13. CD 5/3/51.

H. L. Gentry Constr. Co., 921 Michigan Ave., Jackson, Mich. CA Est. $300,000, natural gas lines, Mt. Olivet, KENTUCKY. Central Kentucky Natural Gas Co., Mt. Olivet, Ky.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	**Latin America**
Sewers, Waste Disposal	**Public Buildings**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects inviolved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
B.A.	**Bids Asked**
ENR	**Engineering News-Record**
CD	**Engineering News-Record Construction Daily**

G. M. Ferris, Athens, Tenn., CA $51,550, WW Imprvs., NIOTA, TENN. Town, Niota, Tenn. Bids Nov. 10.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **H. K. Ferguson Co.**, 1783 E. 11 St., Cleveland 14, O., CA. Est. $5,000,000. PLANT for mfg. nylon-type staple fiber, COVINGTON, VA. Industrial Rayon Corp., Union Commerce Bldg., Cleveland 14, O. CD 11/19.

† **Lang Constr. Co., Inc.**, Hampton, Va., CA $824,000. DINING HALL and KITCHEN BLDG. NO. 116 (domiciliary) and BLDG. 93 alterations, Veterans Admin. Center, KECOUGHTAN, VA. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Oct. 27, awarded Nov. 16. CD 11/2, under LB.

J. Kennon Perrin Co., 6000 W. Broad St., Richmond, Va. CA $246,422, WAREHOUSE-OFFICE, RICHMOND, VA. Bausch & Lomb Optical Co., 626 St. Paul St., Rochester, N. Y.

Carl W. Mullis Lumber Co., Lancaster, S. C. CA $628,800. HOUSING, Proj. NC 19-1, ROCKY MOUNT, N. C. Rocky Mount Housing Auth., Rocky Mount, N. C. Bids Nov. 5. CD 11/17, under LB.

Phillips Constr. Co., Lancaster, S. C. CA $336,324, HIGH SCHOOL, HEATH SPRINGS, S. C. Lancaster Co. Bd. Educ., Lancaster, S. C. Bids Nov. 6. CD 10/26.

Edwards Constr. Co., c/o Hugh R. Broleman, Jr., archt., 1216 E. Colonial Dr., Orlando, Fla., Owner Builds. $350,000. 28 RESIDENCES, GAINESVILLE, FLA.

J. Y. Gooch Co., Congress Bldg., Miami, Fla., CA, $300,000, OFFICE-WAREHOUSE, ST. AUGUSTINE, FLA. Southern Bell Telephone Co., Hurt Bldg., Atlanta, Ga. CD 6/25/46.

James McCormick, 9516 Tampa St., Tampa, Fla., Owner Builds, $350,000, 40 RESIDENCES, TAMPA, FLA.

O'Neal Steel Co., 745 N. 41 St., Birmingham, Ala., Owner Builds, $150,000. PLANT, BIRMINGHAM, ALA.

▲ **Mountaindale, Inc.**, Comer Bldg., Birmingham, Ala., Owner Builds, $1,000,000, 120 RESIDENCES, BIRMINGHAM, ALA.

▲† **Farnsworth & Chambers Co.**, P.O. Box 74, Houston, Tex., CA, $2,588,000, guided missile TEST FACILITIES, Redstone Arsenal, HUNTSVILLE, ALA. U. S. Eng., P.O. Box 1169, Mobile, 7, Ala. Bids Oct. 27. CD 11/11, under LB.

Shelby Constr. Co., 1106 Canal St., New Orleans, La. CA Est. $100,000. WAREHOUSE-OFFICE addn., NEW ORLEANS, LA. Chipley Realty Co., 115 S. Rampart St., New Orleans, La.

Lookout Mountain Presbyterian Church, 316 N. Bragg Ave., Lookout Mountain, Chattanooga, Tenn., rejected bids, CHURCH addn., CHATTANOOGA, TENN., LB $720,200. Will re-advertise. CD 11/11, under LB.

L. & M. Constr. Co., 843 Vance Ave., Memphis, Tenn. CA $350,000. OFFICE, MEMPHIS, TENN. Max Millstead, 2064 Union St., Memphis, Tenn. CD 9/23.

Oliver Warren, 2459 Harvard Ave., Memphis, Tenn. CA Approx. $200,000. LAUNDRY, MEMPHIS, TENN. T. E. Folis, N. Hollywood and Jackson Ave., Memphis, Tenn.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ind., Bloomington**—B.A. 12/29—Bd. P. Wks. Mayor E. Kelly, chn., City Hall, WW imprvs., filtration plant, district mains, standpipe, $1,500,000. Consoer, Townsend & Assocs., 321 E. Ohio St., Chicago, Ill., consult. engrs. CD 5/26.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

INDIANA—State Hy. Comn., State House Annex, Indianapolis, rejected bids Nov. 17, 2 continuous rein.-con. slab bridges over Pike Creek and rein.-con. slab bridge over Bell Creek, Delaware Co. LB, $59,855. CD 11/6.

▲ **INDIANA**—State Hy. Comn., State House Annex, Indianapolis, Zone 4,

R. L. Schutt Co., 120 E. Market St., Indianapolis, 4, Ind., LB, $109,057, est. $144,503 1 span 50 ft. steel beam (twin superstructure) bridge, over Little Sugar Creek, Shelby Co.; LB $193,416, est. $229,371 2 bridges over Mill Creek and over Prairie Creek, Fountain Co.; LB $127,800, est. $159,617 3 span 124 ft. continuous bridge over Cicero Creek, Hamilton Co.;

John R. Gates, 2410 Springfield St., Fort Wayne, Ind., LB, $73,375, est. $90,909 3 span 180 ft. rein.-con. girder bridge over Eel River, Wabash Co.; LB $99,870, est. $123,967 1 span rein.-con. culvert over creek; 3 span rein.-con. girder bridge over Little Elkhart River, Elkhart Co.;

Rieth-Riley Constr. Co. Inc., 901 Nappanee St., Goshen, Ind., LB, $235,376, est. $260,890 2 bridges, over Correll Creek and over Blue River, Noble Co.; LB, $289,898, est. $308,646 2 bridges over Elkhart River over Dry Run Ditch, Elkhart Co.;

(Continued on page 72)

Will this happen to your next bid?

Whether or not you beat competition on a bid could depend on your bond rate. If you're ready with a *low, preferred* bond rate, you'll have an important advantage at your next letting.

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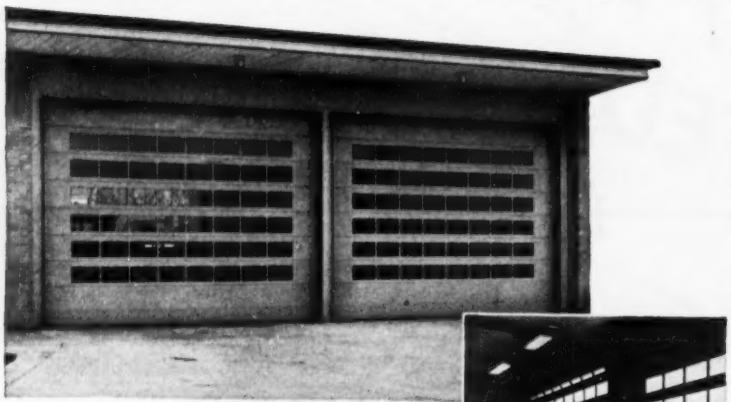
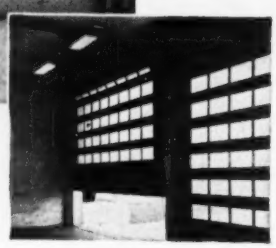
Kinnear Steel RōL-TOP Doors





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Will not sag, warp, rot or split
Built to fit openings of various sizes
Easy space-saving upward action
Opens completely out of the way
Lasting resistance to fire, wind, weather
Heavy-duty torsion spring counterbalance
Provision for any number of glass panels
Easily installed in old or new buildings

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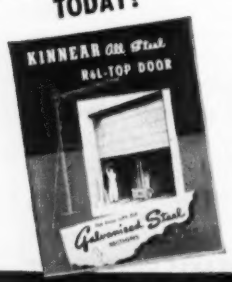

In Kinnear Steel RōL-TOP Doors, you get the efficiency of smooth ball-bearing upward action . . . *plus* all-steel strength and durability . . . *plus* provision for glass panels in one or more door sections, as desired.

*To assure extra service life with minimum maintenance, the rugged steel sections are given a heavy coating of pure zinc (1.75 oz. per square foot of flat metal per ASTM standard) by the hot process. Then Kinnear's Paint Bond (a special phosphate immersion process) is added, to make sure paint will adhere *immediately and thoroughly* to the protective zinc coating.

In every detail, Kinnear Steel RōL-TOP Doors feature extra strength and ruggedness, for long, heavy-duty, low-cost performance. Sizes to fit any opening. Manual, chain, or motor operation. WRITE FOR FULL DETAILS.

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Saving Ways in Doorways

Kinnear Steel RōL-TOP Doors are designed and built by the same door specialists who *originated* the door with the interlocking steel-slat curtain—famous for more than half a century as the Kinnear Steel Rolling Door.

The KINNEAR Manufacturing Co. *Offices and Agents in All Principal Cities*

FACTORIES: 1820-40 Fields Ave., Columbus 16, O.—1742 Yosemite Ave., San Francisco 24, Calif.

(Continued from page 70)

Harold Tharp & Son, Fountain City, Ind., LB, **$126,990,** est. $151,699 3 span 84 ft. rein.-con. girder bridge over Symonda Creek, Fayette Co.;

J. L. Wilson, Bloomfield, Ind., LB, **$119,006,** est. $134,278 1 span 25 ft. rein.-con. arch bridge over Reagan Run, Boone and Clinton Counties;

J. S. Sweet, Cambridge City, Ind., LB, **$126,853,** est. $177,885 1 span (twin structures) steel beam bridge over Little Sugar Creek, Shelby Co.;

Kahl & Mahon, Liberty, Ind., LB, **$168,112,** est. $178,583 1 span 36 ft. rein.-con. girder bridge over Pigeon Creek, Steuben Co.;

G. H. Allen, 230 American Bank Bldg., Vincennes, Ind., LB, **$294,971,** est. $370,126 rein.-con. girder and continuous steel beam bridge, over Busseron Creek, Sullivan Co.;

McCalman Constr. Co., Danville, Ill., LB, **$120,969,** est. $126,818 1 span 30 ft. rein.-con. arch bridge, Vermillion Co.;

Gradle Bros. Inc., Carmel, Ind., LB, **$136,707,** est. $149,302 2 bridges over Walnut Fork, Montgomery Co. Bids Nov. 17. CD 11/6.

INDIANA—State Hy. Comn., State House Annex, Indianapolis,
rejected bids Nov. 17, c. conc. base wid'n., b. conc. resurf., and resurf. 3.993 mi. State Rt. 421, Versailles and Osgood, Ripley Co., LB **$144,201,** c. conc. 7.482 mi. State Rd. 64, Pike and Dubois Counties, LB **$741,836.** CD 11/6.

† **Massman Constr. Co.,** 1221 Baltimore Ave., Kansas City, Mo., LB, **$477,820,** est. $585,425 stone dike and bank protection Mississippi River, Chain of Rocks Canal, Madison Co., CIVENG-23-065-54-43, ILLINOIS. U. S. Eng., 420 Locust St., St. Louis 2, Mo. Bids Nov. 10. CD 10/26.

† **Walter T. Dunlap Co. & Inland Constr. Co.,** Lexington, Neb. LB, **$228,793,** est. $238,113 pressure relief wells Degognia and Fountain Bluff Levee and Drainage Dist. Proj. Item VI-B, Jackson Co., ILLINOIS. U. S. Eng., 420 Locust St., St. Louis 2, Mo. Bids Nov. 12. CD 10/20.

WISCONSIN—State Hy. Comn., State Office Bldg., Madison,

John F. Beasley Constr. Co., 20 N. Wacker Dr., Chicago 6, Ill., CA, **$683,207,** structure Contract 1 Mauston-S. T. H. 13 (Point Bluff Bridge) Road S. T. Hy. 71, S-0489 (2), Juneau and Adams Counties. Bids Nov. 17. CD 10/29.

▲ **WISCONSIN**—State Hy. Comn., State Office Bldg., Madison,

Jay W. Craig Co., 1814 California St., Minneapolis 18, Minn., CA, **$65,493,** b. conc. 3.906 mi. Proj. F 019-1 (33) and F-019-1 (35), Contracts 3 and 2, **Pierce Co.; CA, $97,695,** b. conc. 5.938 mi. Proj. T 020 (6) and T 020 (4), Contracts 4 and 2 Taylor Co.;

Arthur J. Pagel, Almond, Wis., CA, **$153,604** base course 1.966 mi. Proj. S 0489 (3) Contract 1, Adams Co.;

L. G. Arnold, Inc., P. O. Box 228, Eau Claire, Wis., CA, **$302,337,** base course 2.095 mi. Proj. S 0489 (4), Contract 1, Juneau Co.;

Koch Constr. Co., 239 W. Center St., Milwaukee 12 Wis., CA, **$389,441** c. conc. 7.841 mi. Proj F-03-1 (12), and T 0538 (2), Contracts 1 and 2, Dodge Co.;

White Constr. Co., 710 N. Plankinton Ave., Milwaukee 3, Wis., CA, **$158,312, b.** conc. 5.782 mi. Proj. 0472 (3) and T 0472 (4), Contracts 2 and 3, Kenosha Co. Grand total $1,166,882. Bids Nov. 17. CD 10/29.

Santucci Constr. Co., Skokie, Ill. CA **$86,788.** central relief sewer; MARSHALL, MICH. City, Clarence Bay, comr. P. Wks. Dpt., Marshall, Mich. Bids Nov. 2. CD 10/8.

Cooke Contg. Co., 1116 Penobscot Bldg., Detroit, Mich. CA **$194,742.** c. conc. surf. 52,565 sq. yd. parts 9 streets, WARREN, MICH. Bd. Rd. Comrs. Macomb Co., County Bldg., Mount Clemens, Mich. Bids Nov. 3. CD 10/22.

BUILDINGS

LOW BIDS AND CONTRACTS

Daflo Co., 24 N Jefferson St., Dayton, O. Own Forces. $384,000. RESIDENCES, Burkhardt, Hayden, Alexis and De Foe Dr., DAYTON, O.

Kipka Bros., 1901 Columbus St., East Chicago, Ind., CA, **$450,000,** 22 HOMES, EAST CHICAGO, IND. Park Homes, Inc., 3609 Main St., East Chicago, Ind. Grugel Bros., 244 S. Cicero St., Chicago, Ill., archts.

Park Homes, Inc., 3609 Main St., East Chicago, Ill. Owner Builds, **$450,000,** 25 HOMES, EAST CHICAGO, IND. Grugel Assocs., 214 S Cicero St., Chicago, Ill., archts.

Joseph Radice, 4922 Fulton St., Chicago, Ill. Owner Builds, **$300,000,** 20 HOMES, 4900 Block W. Arthington St., CHICAGO, ILL. Dewey & Pavlovich, 4804 N. Kedzie St., Chicago, Ill., archts.

▲ **Irving Rootberg,** 3841 W. Devon Ave., Chicago, Ill., Owner Builds, **$1,100,000,** 13 APARTMENTS, incl. 104-units, CHICAGO, ILL.

R. Stewart Co., 19959 James Couzens Hy., Detroit, Mich. LB **$321,980.** Northwest Elementary SCHOOL, Wyoming and Northfield St., FERNDALE, MICH. City, Ferndale, Mich. Swanson Assoc., W. Long Lake Rd., Bloomfield Hills, Mich., archts. Bids Nov. 16. CD 11/5, under LB.

Preighoff Constr. Co., Pontiac, Mich. LB **$355,761.** general contract 2 story, brick, steel Southfield SCHOOL addn., SOUTHFIELD, MICH. Southfield Twp., Bd. Educ., 24675 Lahser St., Southfield, Mich. Bids Nov. 16. CD 6/16.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Tex., Snyder—B.A. 12/12—City, Unit 1, clear water supply well, $37,000; Unit 2, water pumping unit, $35,000; Unit 3, four m.g.d. rapid sand filter plant, $148,000. Extended date. Freese & Nichols, 407 Danciger Bldg., Fort Worth, engrs. CD 11/12.

† **Tex., Austin**—ARMAMENT-ELECTRONICS REPAIR SHOP—B.A. About 12/16—U.S. Eng., Box 1229, Galveston, armament-electronic repair shop, Bergstrom Air Force Base. $292,125. CD 9/26/51.

† **North Dakota**—AUTO-TRANSFORMERS—B.A. 12/17—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., auto-transformers for Jamestown Sub-station, Transmission Division, Missouri River Basin Proj., Inv. DS 4069. Extended date. L. N. McClellan, ch. engr. CD 10/26.

† **Neb., Lincoln**—PUMPING STATION—B.A. 12/18—U.S. Eng., 1709 Jackson St., Omaha, Neb., pumping station, reservoir at Lincoln Air Force Base, Inv. 25-066-54-23. CD 7/17/52.

Tex., Mount Enterprise—B.A. 12/18—City (a) approx. 127,000 lin. ft. 2- to 6-in. c.i. or cement asbestos water lines, $90,000 (b) various WW sys. imprvs., water supply well, ground concrete water storage, pumping unit, water treatment facilities, etc., $75,-000. Plans deposit $30. Garrett Eng. Co., 5008 Almeda Rd., Houston engr., CD 10/30/51.

† **New Mexico**—B.A. 12/22—Bureau Reclamation, Dpt. Interior, Albuquerque, earthwork, clearing and structures for rehabilitation of drains, Unit AE-1, Middle Rio Grande Proj., vicinity of Albuquerque, Valenica and Bernalillo Counties, Spec. DC-4080. W. A. Dexheimer; comr. adv. ENR 12/3. CD 9/7/44.

BIDS ASKED—BUILDINGS

Tex., Nacogdoches—HOTEL—B.A. 12/10—Nacogdoches Community Hotel Corp., c/o Jack McKinney, pres., Nacogdoches, 6 story bsmnt., rein.-con., brick hotel. $600,000. Plans deposit $25. Extended date. J. N. McCammon, 209 Browder St., Dallas, archt. Carlos Schoeppl, 2701 Biscayne Blvd., Miami, Fla., consult. archt. Sasnett & Bennett, 2701 Biscayne Blvd., Miami, Fla., and F. W. Chappell, Burt Bldg., Dallas, engrs. CD 9/30.

Mo., Kirkwood (St. Louis 22 P.O.)—SCHOOL—B.A. 12/14—Kirkwood School Dist. R-7, Bd. Educ., Floyd W. Hendricks, supt. Schools, 702 S. Kirkwood Rd., 1 story, ground floor, brick, masonry, rein.-con. 2 wing addns. to Geo. R. Robinson School, 803 Couch Ave. Wm. B. Ittner, Inc., 408 Bd. Educ. Bldg., 911 Locust St., St. Louis, Zone 1, engr.-archt. CD 3/6/53.

† **Okla., Fort Sill**—HEAVY EQUIPMENT AND MOTOR REPAIR SHOP—B.A. 12/17—U.S. Eng., Box 61, Tulsa, Zone 2, heavy equip. and motor repair shop, Eng. 34-066-54-31. $344,000. CD 9/6/51.

SOON LETS CONTRACT—BUILDINGS

Mo., Lemay (St. Louis 23 P.O.)—SUPERMARKET—Frank and Anthony Grasso, 3900 Reavis Barracks Rd., Lemay, Zone 23, soon lets contract. 1 story, part bsmnt., 90x135 ft. brick, steel, concrete super-market, paved parking areas, 835 Lemay Ferry Rd. Rime Duzard, 9215 Ladue Rd., Ladue, Zone 24, archt.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MISSOURI—State Hy. Comn., Jefferson City, **M. E. Gilliaz**, Monett, Mo. CA $119,071. two 35 ft., two 65 ft., one 80 ft. continuous I beam spans, Sta. 995 plus 38, Macon Co., Bids Oct. 30, awarded Nov. 10. CD 11/6, under LB.

† **Driver Contg. Co.**, Cotton Exchange Bldg., Memphis, Tenn., LB, $151,800. 660,000 cu. yd. riverside en-largement along White River Backwater levee, Phillips and Desha Counties, Inv. 54-40, ARKANSAS. U. S. Eng., P.O. Box 97, Memphis, Tenn. Bids Nov. 3. CD 10/2.

† **U. S. Eng.**, Box 1229, Galveston, Tex., cancelled bids to have been opened Dec. 15, airfield parking apron,

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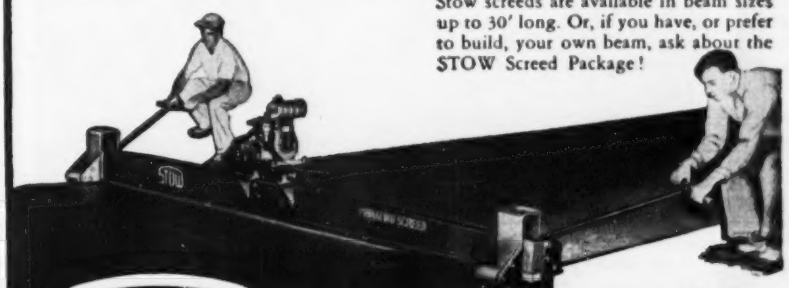

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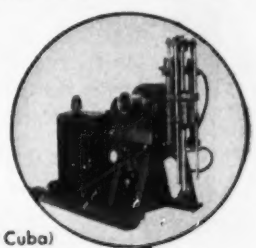
4 ACKER TEREDOS' drill 'round the clock for 3 months



In building the new Almendares Vehicular Tunnel between Vedado and Miramar (two popular communities in Havana, Cuba) four Acker Hydraulic Feed Core drills were used for drilling grout holes. Working *around the clock for almost three months,* the four Ackers showed little sign of wear.

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HERE'S HOW SAUERMAN HELPED A MILL GO UNDERGROUND...

A southern cotton mill needing additional space, decided to go underground and add another floor level below the existing building. Fiske-Carter Construction Co. was selected to do the excavating. Since clearance under the building averaged only about three feet, they used two Sauerman ⅓-cu. yd. Crescent Scrapers running parallel to the columns under the mill to dig the earth and haul it to a central bay. A third scraper, working at right angles, hauled the earth out through a window.

Sauerman Crescent Scrapers are capable of doing the unusual and difficult jobs, as well as commonplace excavating, hauling and stockpiling for storage or delivery. There is a type of scraper than can be economically fitted to almost any materials handling project. Sizes range from ⅓ to 15-cu. yds. Low in first cost, they are economical to maintain and are moderate in power consumption, gasoline, diesel or electric.

Write for Sauerman News-Digest #137 describing the Fiske-Carter story in more detail. Ask for Catalog J which shows Sauerman Scrapers handling a variety of materials in various job applications, including their use with boom machines. Sauerman Bros., Inc., 532 S. Clinton St., Chicago 7, Ill.

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More NEW IDEAS

HOW TO DIG A CLEAN PIT
Rapid shifting equipment spots scraper exactly where wanted. Pit is not rutted, excavation is taken down evenly. EFR 205.

TAUTLINE HANDLES QUARRY STONE
118-foot derrick head mast with 80-foot wooden tail mast allows load to coast down to discharge point. EFR 106.

DIGGING GRAVEL FROM A RIVER
Slackline cableway digs aggregate from a river bar over a 700-ft. span, conveying and automatically dumping into hopper. Lateral shifting of the cableway permits working material at all times. EFR 102.

SEGREGATED ORE STORAGE
Separate grades of ore are stockpiled by scrapers and arranged for dual operation on one pile or with each machine working a separate pile. EFR 104.

STOCKPILING 300,000 TONS OF COAL
Storing and reclaiming is handled by a 10-cu. yd. scraper machine at a large utility. EFR 201.

SIZED SAND AND GRAVEL
Five sizes are stockpiled by five scrapers. Storage piles also serve as ramps for truck loading. One man operation of entire system. EFR 221.

WET CLAY HANDLING
1-cu. yd. Crescent Scraper digs clay for a cement plant. Fifty tons per hour are discharged into an elevated truck hopper. EFR 204.

RECLAIMING INDUSTRIAL WASTE
Two million tons of coal silt are being reclaimed by rapid-shifting scraper. It is processed into fuel for two generating stations. EFR 212.

BULK SUGAR STORAGE
Specially designed scraper buckets cut cost of handling sugar in warehouses and unloading ships. EFR 217.

SAUERMAN NEWS
Removing river bars, excavating under a building, paving under Mississippi, scraper equipped self-unloader boats. SND 137.

REQUEST BY NUMBER—SAUERMAN BROS., INC., 532 South Clinton Street, Chicago 7, Illinois

Foster Air Force Base, Inv. No. ENG-41-243-54-23 VICTORIA, TEX. CD 11/8.

BUILDINGS

LOW BIDS AND CONTRACTS

Jones-Kissner Constr. Co., 706 Chestnut St., St. Louis 1, Mo. CA **$494,283.** 1 story, brick, concrete 60,000 sq. ft. HIGH SCHOOL, U. S. 66 and Mo. 95, St. Louis County, HAZELWOOD (ST. LOUIS 21 P.O.) MO. School Dist. of Hazelwood Reorganized School Dist. R-1, Bd. Educ., Lorene Lusher, supt. Schools, Elm Grove School, Hy. 140 and Taylor Rds., HAZELWOOD, MO. Bids Nov. 4. CD 9/25, under LB.

Swan Constr. Co., 8615 Laclede Station Rd., Affton 23, Mo. CA 1 story, part bsmnt., 100x168 ft., brick, steel SUPERMARKET, Hampton Blvd. and Bancroft Ave., ST. LOUIS, MO. Hampton-Sutherland Investment Co., c/o Gerhardt, Kramer Assoc., archts., 9640 Clayton Rd., St. Louis 24, Mo. Bids Oct. 27. CD 10/26.

Daniel F. Zook, 6918 Delmar Blvd., University City 5, Mo. CA 1 story, 116x113 ft., brick, concrete block WAREHOUSE, 127 W. Barton St., ST. LOUIS, MO. Pollack Realty Co., 808 Chestnut St., St. Louis 1, Mo.

Bumiller & Meyeraieck, 2604 Cherokee St., St. Louis 18, Mo. CA 1 story, 60x210 ft., brick, concrete, steel truck TERMINAL, 731 Campbell St., ST. LOUIS, MO. Earl Bumiller, 5 Lamerton Lane, Kirkwood 22, Mo.

King Constr. Co., Texarkana, Ark., CA **$973,068,** 125 HOUSING units, TEXARKANA, ARK. Texarkana Housing Auth., Texarkana, Ark. Bids Nov. 5. CD 10/28.

Signal Oil & Gas Co., 811 W. 7 St., Los Angeles, Calif. Owner Builds. **$600,000.** GAS RECYCLING PLANT and BUTANE PLANT, ARDMORE, OKLA. Universal Oil Products Co., 310 S. Michigan St., Chicago, Ill., engr. Awarded Nov. 16.

▲ **Chalmers & Borton**, Hutchinson, Kan. CA **$1,090,000.** 2,239,000 bu. concrete GRAIN ELEVATOR, ENID, OKLA. W. B. Johnson Grain Co., Enid, Okla. CD 10/20.

Embe Development Co., 6901 Almeda St., Houston, Tex. Owner Builds. **$385,000.** 48 DWELLINGS, PASADENA, TEX. CD 5/25.

Templeton-Cannon, Box 548, San Angelo, Tex., LB **$388,000,** est. $325,000. 2 story EDUCATIONAL, 1 story SANCTUARY, 1 story SOCIAL HALL and CHAPEL, SAN ANGELO, TEX. First Christian Church, San Angelo, Tex. Bids Nov. 14. CD 9/29.

Quali-Cut Co., c/o L. R. Pietz, 1231 N.W. 56 St., San Antonio, Tex. Owner Builds. **$390,000,** Sect. 5, 60 DWELLINGS; **$340,000,** Sect. 6, 48 dwellings, SAN ANTONIO, TEX. CD 7/24.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† Wash., Fort Lewis—REPAIR SHOP—B.A. 12/30—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, 9,800 sq. ft. battalion tank repair shop, 4,480 sq. ft. infantry reconnaissance tank repair shop, other facilities for tank park, ENG. 45-108-54-85. CD 11/7/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,

Peter Kiewit Sons' Co., 442 Post St., San Francisco, Calif., CA **$4,387,474,** grading, paving structures 3 mi. Ashby Ave. and El Cerrito Overhead, Alameda Co. Bids Oct. 28, awarded Nov. 9. CD 11/5, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

N. B., Moncton—ACCOMMODATION BUILDING—B.A. 12/8—Defence Constr. Ltd., 1032 Gottingen St., Halifax, O.R. and W.D. accommodation bldg. Class II, R.C.A.F. Station, Job 2564. $300,000. Plans deposit $100.

BIDS ASKED—BUILDINGS

N. S., Halifax—BARRACK BLOCK—B.A. 12/9—Defence Constr. Ltd., 1032 Gottingen St., 180-man Barrack Block, No. 1, Job 2671, $350,000; 500-man Mess, No. 1, Garrison Barracks, $400,000. Plans deposit $100 each.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Argo Constr. Ltd., 660 St. Catherine St. W., Montreal, Que. CA, **$876,332,** steel arch hangar, R.C.A.F. Station Uplands Airport, OTTAWA, ONT. Defence Constr. Ltd., 40 Eglinton Ave. E., Toronto 12, Ont. Bids Aug. 27. CD 8/14.

BUILDINGS

LOW BIDS AND CONTRACTS

St. Clair Grain & Feeds Ltd., Richmond St., Chatham, Ont. Owner Builds. **$500,000.** STORAGE ELEVATORS on Thames River, CHATHAM, ONT. A. D. Clark, c/o owner, engr.

W. H. Yates Constr. Co. Ltd., 400 Wellington St. N., Hamilton, Ont., CA, **$300,000,** 3 story, bsmnt., 70x80 ft., concrete, steel, brick OFFICE, Whitney Ave., HAMILTON, ONT. Credit Union National Insurance Society, 42 King William St., Hamilton, Ont. Bids Nov. 2. CD 10/27.

(Continued on page 76)

NEW INTERNATIONAL MEDIUM-DUTY FOUR-WHEEL DRIVE TRUCKS

For Off-Highway or Highway Operation

Now, INTERNATIONAL Truck advanced engineering makes possible another development in transportation efficiency—*two new medium-duty four-wheel drive models* that open new possibilities for truck operators in scores of fields.

You can haul men, tools, equipment to any job—through mud, sand, and snow—over terrain where conventional trucks can't go. With front axle disengaged, you can operate normally on the highway.

Tough-job engineered. These new models are built for the toughest kind of work. Like every INTERNATIONAL, they give the low operating and maintenance cost and long life that have made INTERNATIONAL the heavy-duty sales leader for 21 straight years.

These new INTERNATIONAL 4x4 models have the stamina, ruggedness, and versatility for the toughest jobs. See one today. See how it fits your work. Time payments arranged. See your INTERNATIONAL Dealer or Branch for all the facts.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

New INTERNATIONAL R-160 (4x4) with 2-yard dump body and reversible trip blade 8½-foot snow plow. GVW rating, 11,000 lbs. Famous Comfo-Vision cab.

Brief Specifications of these new INTERNATIONAL medium-duty 4x4 models

Two chassis models. Model R-140 (4x4)—130-inch wheelbase, 60-inch CA; 142-inch wheelbase, 72-inch CA, GVW rating 11,000 lbs. Model R-160 (4x4)—154-inch wheelbase, 84-inch CA; 172-inch wheelbase, 102-inch CA, GVW rating 15,000 lbs.

All-truck power. Model R-140 (4x4), 100-hp. Silver Diamond 220 valve-in-head engine. Model R-160 (4x4), 108-hp. Silver Diamond 240 valve-in-head engine.

Eight forward speeds, two reverse. Transmission has four forward speeds, one reverse, with 2-speed transfer case.

Easily converted for highway use. Special transfer case permits disengaging front axle for normal 2-wheel drive operation.

Transmission power take-off openings on right and left side to handle front-mounted winch.

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Better roads mean a better America

INTERNATIONAL® TRUCKS

"Standard of the Highway"

Shoring system and beams support wall of existing structures
Bay unexcavated - to save underpinning of structure later to be demolished
Access to subway is underpinned and maintained

Project: Rebuilding Jordan Marsh, Boston Department Store, a section at a time.
Contractor: Thompson Starrett, Inc.
Architect: Perry, Shaw & Hepburn
Engineer: Maurice A. Reidy

CONTINUOUS MAT PUT IN FAST AS BIG STORE REPLACES ITSELF

This project had to be handled in separate sections, so that the store could continue doing business during construction. Section II, a 900 x 94 ft. portion of the property, is shown above with the highlights noted. It was necessary to use extreme care in the installation of the 30 ft. high system of pilot beams and horizontal sheeting to prevent movement of adjacent buildings and streets.

The drainage problem was simplified by our installation in Section I of a drainage system which had the capacity to remove the water of both sections.

Have you a foundation problem? We would be glad to talk it over. Catalogue on request.

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IN CANADA: SPENCER, WHITE & PRENTIS OF CANADA, LTD.
TORONTO: 700 BAY ST. • MONTREAL: 2052 ST. CATHERINE ST., WEST

(Continued from page 74)

Finlay W. McLachlan, 195 Fairbank Ave., Toronto, Ont., CA, $268,000, 1 story, 51,000 sq. ft., rein.-con., brick FACTORY, near Islington Ave., TORONTO, ONT. A. Kimball Ltd., 187 Geary Ave., Toronto, Ont. Awarded Nov. 10.

Donat St. Amour, Masson, Que., CA, $384,000. 16-classroom SCHOOL, GATINEAU, QUE. La Commission Scolaire de Gatineau, L. Giroux, secy., Gatineau, Que. CD 7/20.

U. S. POSSESSIONS

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **E. E. Black, Ltd.**, Honolulu, T.H. CA $4,518,582. Kalihi Hy. Tunnel, HONOLULU, T.H. City, City Hall, Honolulu, T.H. Bids Oct. 20, awarded Nov. 12. CD 10/28, under LB.

Proposed Projects

WATER SUPPLY

Fla., Clearwater—City, City Hall, water distr. sys. addn. $500,000. Briley, Wilde & Assocs., Daytona Beach, consult. engrs.

Ga., Decatur—De Kalb Co., Court House, 30 in. water mains in Brookhaven-North Decatur Area, $500,000. Robert & Co. Assocs., 96 Poplar St. N.W., Atlanta, consult. engrs. CD 4/14/52.

▲ **Ind., Kokomo**—Kokomo Waterworks Co., Kokomo, 1 billion gal. capacity water reservoir, $1,500,000.

Michigan—Michigan Water Resources Bd., M. P. Adams, exec. secy., Lansing, water facilities, in Macomb, Wayne and Oakland Counties, $775,000, L. G. Lenhardt, Detroit Water Bd., Randolph St., Detroit, ch. engr.

Mich., Jackson—City, City Hall, water sys., two 1.5 m.g. elevated steel water storage tanks, each Eastern and Northwestern Sects. $650,000. CD 11/30/44.

Mich., Pleasant Ridge—South Oakland County Water Auth., 23646 Woodward St., water storage 10 m.g. elevated steel tank, 13 Mile Rd. and Woodward, $500,000. CD 7/2.

▲ **N. C., Burlington**—City, Burlington, bond election Dec. 15, water imprvs. and expansion $1,800,000. Wm. C. Olsen, 5 Exchange Pl., Raleigh, consult. engr. CD 7/16.

Tex., Houston—City, City Hall, 900 Brazos St., 6 mi. 12- to 30-in. c.i. water line, from foot of Roland St. to Hardy St., then branching out in several directions, $861,800. Koch & Fowler, 3900 Lemmon St., Dallas, consult. engrs. CD 2/11.

Alta., Jasper Place—Town, Town Hall, water and sewage system exten. $500,000. Haddin, Davis & Brown Ltd., 9912A 109 St., Edmonton, consult. engr. CD 1/25/51.

SEWERS, WASTE DISPOSAL

▲ **Calif., Sunnyvale**—City, City Hall, $1,500,000 bond election Jan. 26, sewage treatment plant, system, etc. Brown & Caldwell, 66 Mint St., San Francisco, consult. engrs. CD 4/23.

▲ **Calif., Watsonville**—City, City Hall, voted $1,865,000 bonds, sanitary and storm sewers. CD 9/30.

▲ **Fla., Clearwater**—City, City Hall, (1) sanitary sewer imprvs., $500,000 (2) storm sewers, $500,000. Briley, Wilde & Assocs., Daytona Beach, consult. engrs.

Ill., Bradley—Village, Village Hall, sewage treatment plant and interceptor sewers, $550,000. Warren & Van Praag, 253 S. Park St., Decatur, consult. engrs.

▲ **Wash., Seattle**—Southwest Suburban Sewer Dist., c/o W. E. Moshier, 11935 Marine View Dr. S.W., voted bonds, trunk sewers, $750,000; lateral sewers, $5,500,000. Parker, Hill & Ingman, 1728 E. Madison St., consult. engrs. CD 11/16.

W. Va., Point Pleasant—Mason Co., sewage disposal plant, $600,000. Settle Engineers, Inc., Peoples Bldg., Charleston, consult. engr. CD 7/22.

BRIDGES

▲ **Calif., Los Angeles**—City, City Hall, Los Feliz Blvd. Grade Separation, $1,493,200; Washington Blvd. Underpass of Santa Fe R.R., $569,355.

N. H., Manchester—City, 500 ft. bridge over Merrimack River, at Granite St. $550,000. Thomas Worcester, Inc., 85 State St., Boston, Mass., consult. engr.

▲ **O., Cleveland**—Baltimore & Ohio R. R. Co., J. W. Purdy, engr. Maint. & Way (Western Region), Temple Bar Bldg., Cincinnati, railroad bridge over Cuyahoga River at Sycamore St. $3,000,000.

▲ **O., Cleveland**—New York Central System, F. H. Simpson, ch. engr. (West of Buffalo), LaSalle St. Station, Chicago 5, Ill., overpass at E. 55 St. and Memorial Shoreway, $1,250,000.

▲ **O., Cleveland**—New York, Chicago & St. Louis R.R. Co. (Nickel Plate Road), H. F. Whitmore, ch. engr., Terminal Tower, Zone 1, vertical lift bridge over Cuyahoga River, 3.05 mi. from mouth at University Rd., lift span, 267 ft., overall length incl. piers 484 ft., to carry two sets of tracks, designated as Govt. Bridge No. 15. $4,000,000-$5,000,000. Hardesty & Hanover, 101 Park Ave., New York, N. Y., consult.

engrs. R. T. Blewitt, Nickel Plate bridge engr., c/o owner.

STREETS AND ROADS

▲ **W. Va., Charleston**—City, City Hall, voted $3,500,000 bonds, opening Dickinson St. from Quarrier St. to Virginia St., **$375,000**; opening and extending Brown St. from Quarrier to Randolph Sts., incl. bridge across Elk River, **$1,775,000**; extending Alderson St. from edge of Brown property to make a connection with Laidley St. at Lee, **$100,000**; opening Seventh Ave. from Adams to Virginia Sts. with necessary widening to Florida St., **$250,000**; municipal parking lot and acquisition of slum property as site for new exposition hall. CD 10/19.

EARTHWORK, WATERWAYS

▲ **Oregon, Portland**—General Electric Co., 621 S.W. Alder St., Portland, constr. Timothy Meadows Dam, 660 ft. long, earthfill, Clackamas Co. **$2,000,000**. Fred G. Hodge, c/o owner, engr. CD 3/23.

▲ **Wash., Seattle**—Seattle City Dpt. Lighting, City Light Bldg., 1015 3 Ave., Zone 4, hydro-dam on Pend Oreille River at Boundary site producing perhaps 400,000 kw, Metaline Falls. **$25,000,000**. E. R. Hoffman, city light supt.

▲† **Alaska, Kodiak**—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., 2 breakwaters, 1,250 and 780 ft. long, dredging 11.7-acre small-boat basin to depths of 12 and 8 ft. **$1,504,000**.

▲ **Ontario**—Hydro-Electric Power Comm. of Ontario, 620 University Ave., Toronto, dam and generating station at Manitou Falls, English River, 4 units, Kenora District, **$15,577,000**.

AIRPORTS

▲† **La., New Orleans**—AIRPORT IMPRVS.—Eighth Naval Dist., 600 South St., control layouts, drawings, specifications for surveying and soil analysis, runways, taxiways, parking aprons, drainage roads, railroad siding, utilities, etc., Bedell & Nelson, 840 Union St., New Orleans, engrs.; control tower, communication facilities, 3 airplane hangars, George A. Heft & Co., 820 Union St., New Orleans, engrs.; plans by August Perez & Assoc., Aubudon Bldg., New Orleans, warehouses, public works facilities, automotive shops, Joint Air Reserve Training Center at Alvin Callender Air Field at Belle Chasse, **$16,000,000**.

▲† **Nev., Fallon**—AVIATION FACILITIES—P. Wks. Office, Twelfth Naval Dist., San Bruno, Calif., plans by

RUBBING CEILINGS?

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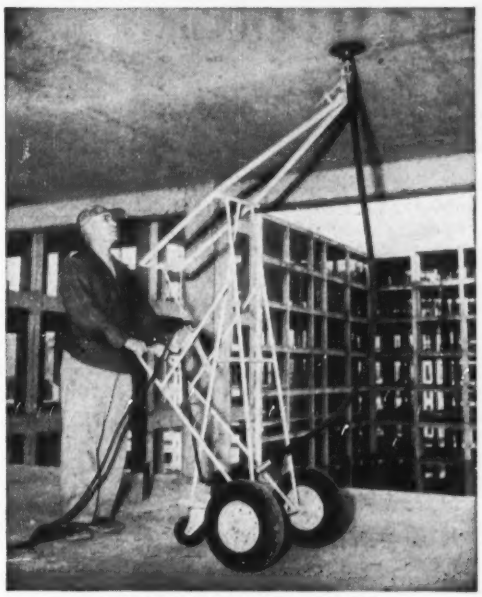

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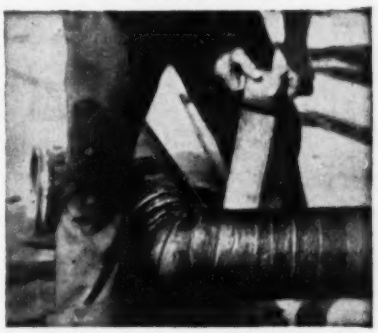

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TAPECOAT comes in rolls of 2", 3", 4", 6", 18" and 24" widths to meet varying requirements.

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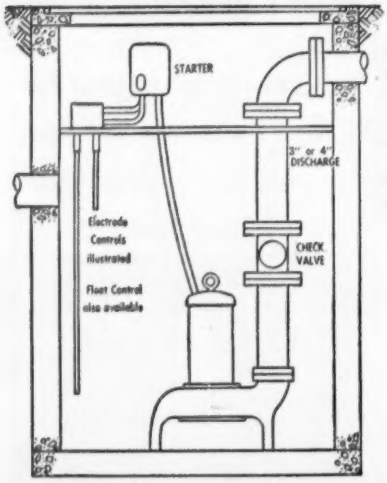

Pumps ALL Sewage

From Lift Stations — From Disposals — From Laundry Trays — All Household Sewage — All Industrial Sewage — even RAGS.

The Submersible handles anything that will pass through sewage lines.

Designed

- **To operate UNDERWATER**
- **for BELOW floor level installation**
- **for installation in LIMITED SPACE**
- **for DUST-PROOF operation**

Capacities: 35 to 300 G.P.M. Heads to 45 feet

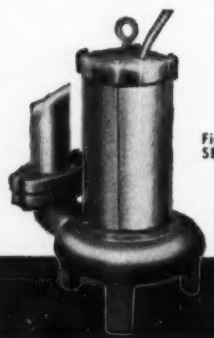

Fig. SE 860

Underground Lift Station with Submersible Pump in wet pit. Requires no pump house to mar the landscape. Duplex units furnished with alternators.

For Heavy Duty Installation—4" discharge—½ to 3 HP. See Bulletin SE 860. Max. dimensions: Dia. 23", Hgt. 28".

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Sverdrup & Parcel, Inc., archt.-engr., addn'l. aviation facilities at Naval Auxiliary Air Station, **$5,200,000.**

▲† **Tex., Lackland Air Force Base**—HOSPITAL—U. S. Eng., 606 Santa Fe Bldg., Galveston, plans by Associated Architects (Rivoire & Poole, engrs., Wirtz, Calhoun, Tungate & Dill, archts.), 2506 Richton St., Houston, 500-1,000 capacity hospital, **$4,500,000;** water sys., **$50,000;** sanitary sewers, **$70,000;** storm sewers, **$65,000;** constr. and paving roads, streets, **$85,000;** natural gas distr. sys., **$60,000;** outside areas electric lighting sys., **$62,600;** grading, excavating, levelling, filling, **$55,000,** foregoing for hospital area zone site. CD 9/14/51.

LATIN AMERICA

▲ **Colombia, Bogota**—Instituto Nacional de Fomento Municipal, Bogota, plans 69 m.g.p.d. aqueduct, presedimentation works, pumping station and treatment plant, **$15,000,000;** transmission line, **$10,000,000.** Buck, Seifert & Jost, 112 E. 19 St., New York, N. Y., U. S. A., and Pitometer Co., 50 Church St., New York, N. Y., U. S. A., consult. engrs. CD 1/12.

▲ **El Salvador, Acajutla**—Comision Ejecutiva del Puerte de Acajutla (CEPA) Direccion de Urbanismo y Arquitectura, Avenue sur 74, San Salvador, plans harbor imprvs., breakwater, railroads, concrete roads, steel frame bldgs. **$20,000,000.** Parsons, Brinckerhoff, Hall & Macdonald, 51 Broadway, New York 6, N. Y., U. S. A., consult. engrs., will make a survey of project. CD 3/13.

▲ **Mexico**—Guanos y Fertilizantes, V. Carranza, 25, Mexico City, plans fertilizer factories, Guanajuato-Tamaulipas, Salamanca-Reynosa. **$1,000,000.**

PUBLIC BUILDINGS

▲ **Ill., Harvey**—SCHOOL—School District No. 152 15148 Loomis St., plans by Louis N. Bailuff, 35 E. Wacker Dr., Chicago, Zone 1, 4 new schools and 1 school addn. **$1,700,000.**

▲† **Ill., Ipava**—ASSEMBLY PLANT—Atomic Energy Comn., 1901 Constitution Ave. N.W., Wash., D. C., announced plans to construct the Illinois Weapon Assembly Plant on Spoon River, here have been cancelled and project abandoned. **$26,000,000.** CD 6/23.

▲ **Ky., Louisville**—LIBRARY—University of Louisville, 2301 S. Third St., plans by R. B. O'Connor & W. H. Kilham Jr., 101 Park Ave., New York, N. Y., and Nevin & Morgan, assoc. archts., Starks Bldg., Louisville, **$2,500,000.** CD 3/19/51.

▲ **Me., Falmouth**—SCHOOL—State, Norman W. Greenlaw, Dpt. Institutions & Service, State House, Augusta, plans by Stevens & Saunders, 187 Middle St., Portland, School for Deaf, Mackworth Island, **$1,000,000.**

Mass., Amherst—SCHOOL—Towns of Amherst and Pelham, Town Hall, Ralph W. Goodrich, secy., Amherst, plans by Nichols & Butterfield, 988 Farmington Ave., West Hartford, regional high school. **$800,000.** CD 9/10.

Mich., Albion—SCHOOLS—City, Bd. Educ., Albion, voted **$750,000** bonds, 2 brick schools, Warren S. Holmes Co., 2200 Olds Tower, Lansing, archt. CD 10/1.

▲ **Mich., Lincoln Park**—WAREHOUSE—State, George J. Burke, Jr., chn. Liquor Control Comn., Lansing, brick, steel, concrete state liquor warehouse, house offices, centralize warehouse operations 12 acres, Dix near Southfield, **$2,000,000.** CD 12/52, under Mich., Detroit.

▲ **Minn., Brainerd**—SCHOOLS—Bd. Educ., H. C. Nordgaard, supt., voted **$1,950,000** bonds Nov. 10, 3 grade schools, Junior High School addn. H. H. Swanson, 500 Sexton Bldg., Minneapolis, archt. CD 10/28.

Minn., St. Paul Park—SCHOOL—Bd. Educ., M. L. Oltman, clk., voted **$700,000** bonds Nov. 10, grade school addn., high school gymnasium and shops. E. D. Corwin, E. 818 First National Bank Bldg., St. Paul, archt. CD 2/23/51.

N. J., West Caldwell—SCHOOL—Caldwell—West Caldwell Joint School District, West Caldwell, plans by Starrett & Van Vleeck and Reginald E. Marsh, 101 Park Ave., New York 17, N. Y., grammar school, Prospect St. **$753,000.**

▲ **N. Y., New York**—GARAGE, etc.—Dpt. Sanitation, 125 Worth St., Zone 13, garage and incinerator alterations, 522-50 E. 74 St. **$2,700,000.** Peter A Strobel, 70 W. 40 St., Zone 36, engr.

▲ **N. Y., Vestal**—COLLEGE BLDGS.—Bd. Trustees University of State of New York, Capitol, Albany, Zone 1, plans constructing college bldgs. for Harpur College. **$10,000,000.**

▲ **N. C., Butner**—TRAINING SCHOOL, etc.—State Hospital Bd. Control, Roy Purser, bus. mgr., Capitol Bldg., Raleigh, plans by H. Raymond Weeks, Durham, training school for feeble-minded, **$4,500,000;** plans by Six Associates, Inc., 1095 Hendersonville Rd., Asheville, renovation of 7 bldgs., **$3,030,000,** at Butner Hospital.

▲ **N. C., Goldsboro**—SCHOOL—State Hospital Bd. Control, Roy Purser, bus. mgr., Capitol Bldg., Raleigh, plans by McMinn, Norfleet & Wicker, Box 988, Greensboro, school for feeble-minded Negroes. **$4,500,000.**

▲ **N. C., Raleigh**—MALE WING—State Hospital Bd. Control, Roy Purser, bus. mgr., Capitol Bldg., plans by A. J. Maxwell, Jr., Borden Bldg., Goldsboro, renovation of male wing at "Dix Hill". **$1,500,000.**

▲ **Ore., Medford**—SCHOOLS—Jackson School Dist. 49, Medford, voted bonds, elementary school, **$350,000;** Junior High School, **$860,000.**

Ore., The Dalles—SCHOOL—Wasco Co. School Dist. No. 7, The Dalles, plans by John Whitney, Yakima, Wash., Elementary and Junior High School, **$780,000.**

▲ **Tex., Dallas**—SCHOOLS—Dallas Independent School Dist., 3700 Ross St., plans by Robert D. White, 349 Oaklawn St., Sunset High School addn. $450,000; plans by Smith & Mills, Mercantile Bank Bldg., Oliver W. Holmes Junior High School, Cedar Crest area, $1,250,000; plans by Fooshee & Cheek, 1913½ N. Harwood St., John B. Hood Junior High School, Pleasant Mound on Hume Dr., $1,500,000; plans by Gordon, Hefley & Hall, 5526 Dyer Ave., W. H. Adamson High School in Southwest Oak Cliff, $1,500,000. CD 10/24/52.

Tex., Refugio—HIGH SCHOOL—Refugio Independent School Dist., Refugio, voted bonds Nov. 14, high school. $800,000. H. E. Kellner, 406 Austin Hy., San Antonio, arct. CD 11/2.

▲ **Va., Fredericksburg**—SCIENCE—Mary Washington College, Fredericksburg, plans by J. Binford Walford-O. Pendleton Wright, 103 E. Cary St., Richmond, science bldg. $1,708,000. CD 9/21.

▲ **Wash., Opportunity**—SCHOOL—Central Valley School Dist., Opportunity, plans by V. L. Wulff, W. 1526 Riverside St., Spokane, high school. $1,000,000.

▲ **Wash., Seattle**—SCHOOLS—Highline School District 401, 253 S. 152 St., voted bonds, Junior-Senior High School at White Center, $1,000,000; elementary school on North Hill, $300,000. CD 10/23.

▲ **Wis., Janesville** — SCHOOL — Bd. Educ., Janesville, voted $3,750,000 bonds, Senior High School. Law, Law, Potter & Nystrom, 121 S. Pinckney St., Madison, consult. engrs. CD 3/30/50.

▲ **Wyo., Casper**—SCHOOL—Natrona Co. High School Dist. No. 2, plans by Karl Krusmark, 722 S. Center St., Junior High School, auditorium, gymnasium, $1,150,000; plans by Robt. Wehrli, 406 Wyoming National Bank Bldg., and Goodrich & Wilking, 226 E. Second St., Junior College and Admin. Bldg., $800,000. CD 10/29.

▲† **Alaska, Anchorage**—POST OFFICE, etc.—General Services Admin., General Services Bldg., Wash. 25, D. C. combined post office and office bldg. $9,955,000.

▲ † **Alaska, Fairbanks**—POST OFFICE, etc.—General Services Admin., General Services Bldg., Wash. 25, D. C., combined post office and court house, $1,000,000.

▲ † **Alaska, Juneau**—FEDERAL and TERRITORIAL—General Services Admin., General Services Bldg., Wash. 25, D. C., federal and territorial bldg. $2,090,000.

▲ † **Alaska, Kodiak**—POST OFFICE, etc.—General Services Admin., General Services Bldg., Wash. 25, D. C., combined post office and office bldg. $1,010,000.

▲ † **Alaska, Nome**—POST OFFICE, etc.—General Services Admin., General Services Bldg., Wash. 25, D. C., combined post office and court house, $1,780,000.

† **Alaska, Palmer**—POST OFFICE—General Services Admin., General Services Bldg., Wash. 25, D. C., post office, $980,000.

† **Alaska, Petersburg**—POST OFFICE, etc.—General Services Admin., General Services Bldg., Wash. 25, D. C., combined post office and office bldg. $970,000.

▲ † **Alaska, Seward**—POST OFFICE, etc.—General Services Admin., General Services Bldg., Wash. 25, D. C.,

▲ **Ont., Windsor**—COURT HOUSE—Essex Co., C. A. Keeley, clk., Sandwich St. E., plans by D. J. Cameron, Bartlet Bldg., court house, $1,000,000.

COMMERCIAL BUILDINGS

▲ **Calif., Irvington**—HOUSING DEVELOPMENT—Sunnyacres Development Co., Mission, San Jose and Olive Sts., plans by Donald M. Shaw, 3565 Mt. Diablo Blvd., Lafayette, housing development incl. 100-residences. $1,000,000.

▲ **Calif., Napa** — HOSPITAL — Sisters of St. Joseph, Napa, hospital, $1,000,000.

▲ **Calif., Sacramento** — SHOPPING CENTER, etc. — James J. Cordano, 825 J St., shopping center and housing development, at intersection of Florin Rd. and Franklin Blvd. Parkway Estates, near here. $5,000,000.

▲ **Calif., San Francisco**—HOTEL—Olympic Club 524 Post St., hotel, Post and Main Sts. $12,000,000.

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- MINERALS
- DAMS & BRIDGES
- BUILDINGS

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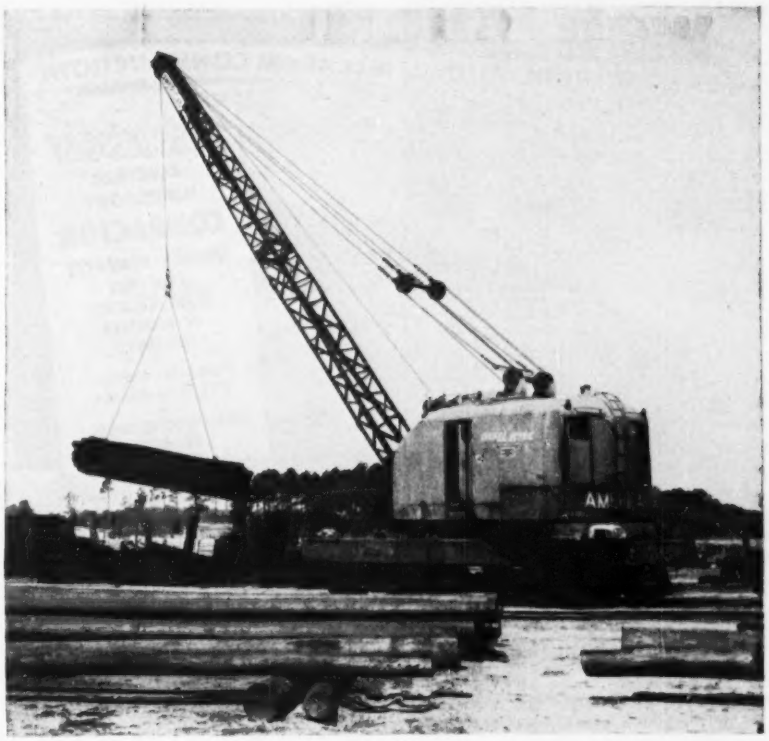

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One of America's earliest exports was pine pitch—or naval stores—to English shipyards. The pitch kept wooden ships watertight. Today, though iron hulls ply the seas, the term "naval stores" still means pine pitch and turpentine. Yet modern producers of naval stores, like the Langdale Company, Valdosta, Ga., must constantly explain to "landlubbers" that their business is NOT ship supplies!

Extracting gum or pine pitch for turpentine from 130,000 acres of timberland, is one of Langdale's many operations. The Company also produces lumber, creosoted poles, railroad ties, fence posts and other wood products. In this highly organized operation, materials handling *on schedule* is a must! Poles need sorting. Cross ties must be stacked. Lumber has to be moved. Rail cars must be switched. This work is done "around the clock" by the dependable 25 ton American DiesElectric shown above.

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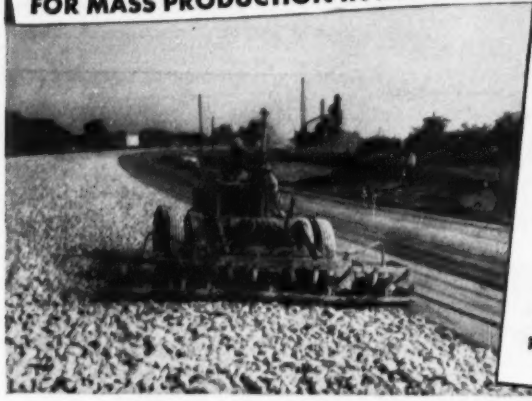

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IN GRAVEL SUB-BASES (Blanket Course) 7" thick, at optimum moisture, the JACKSON in one pass obtains densities exceeding 100% Standard Proctor. Vibratory frequency may be varied to suit conditions.

FLEXIBLE: The JACKSON is available in a standard width of 13', 3". Units may be subtracted on job to meet conditions requiring narrower widths. One 26" unit can be detached and fitted with handle, providing self-propelled compactor for restricted areas, pavement patching, paving drives, compaction of granular soils in trenches, etc.

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CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN, PENNA. U.S.A.

MANUFACTURERS OF THE CEMENT GUN

▲ **Idaho, Mountain Home**—HOUSING UNITS—U. S. Eng., City-County Airport, Walla Walla, Wash., construct, manage and finance, 500 housing units at Air Force Base. $5,000,000.

▲ **Me., Bangor**—RECREATIONAL—Bangor Recreational Center, Robert N. Haskell, chn. Bd. Trustees, Bangor, plans by Eaton W. Tarbell & Assoc., 84 Harlow St., recreational bldg., Bass Park. $1,200,000. CD 5/15/52, under Public Buildings.

▲ **Mich., Saginaw**—BUILDING—Young Men's Christian Assn., National Bldg. Bureau, 19 S. LaSalle St., Chicago, Ill., new building, $1,500,000, Saginaw Voters will decide Dec. 22 referendum whether to sell city owned site for proj.

▲ **N. Y., Flushing**—STUDENT CENTER—Queens College, 65-30 Kissena Blvd., Zone 67, student center, northwest portion of campus. $1,000,000.

▲ **N. Y., New York**—APARTMENT—1025 Fifth Ave. Realty Co., 4 E. 46 St., Zone 17, plans by H. I. Feldman, 415 Lexington Ave., Zone 17, apartment, 1025 Fifth Ave., and 3-15 E. 83 St. $1,300,000.

N. Y., New York—APARTMENT—Greenwich Apartments, Inc., 740 Grand Concourse, Zone 51, plans by Greenberg & Ames, 303 Fourth Ave., Zone 10, 10 story apartment, 16 St. and Avenue of Americas. $800,000.

N. Y., New York—APARTMENT—Putter-Vernon Building Corp., 2050 Hering Ave., Zone 61, plans by George C. Miller, 19 W. 44 St., Zone 36, 6 story apartment, Pelham Parkway South, southwest corner of Wilson Ave. $900,000.

N. Y., Yonkers—APARTMENTS—Nuova Bros., Inc., c/o Gustave W. Iser, archt., 95 Madison Ave., New York, Zone 16, Midland Terrace Apartments, two 6-story bldgs., Midland Ave. $870,000.

▲ **O., Cleveland**—Y.M.C.A. BLDGS.—Young Men's Christian Assn., 2200 Prospect Ave., Zone 15, plans by C. E. McBurney, 19 LaSalle St., Chicago, Ill., 4 story, 660,000 cu. ft. Brooklyn-Parma Branch, W. 25 St. and Selzer Ave., $1,062,500; Broadway Branch, $1,000,000; Euclid Branch, $586,000; Glenville Branch, $586,000; Lakewood Branch, $586,000; Northwest Branch, $1,000,000; West Park Branch, $586,000.

▲ **Okla., Oklahoma City**—APARTMENT HOTEL—Mid Western Development Co., Chickasha, 12 story, 132-unit apartment hotel, 9th and Robinson Sts. $1,000,000. Wm. B. Schultz, c/o owner, engr.

▲ **Tex., Denison**—HOUSING—U. S. Eng., Box 61, Tulsa, Okla., plans by Temple Phinney, archt.-consult. engr., 1705 Field St., Dallas, construct, manage, and finance, 300-units, probably brick exterior, Wherry Housing Proj. $2,250,000.

▲ **Tex., Houston**—APARTMENT—H. R. Houck, Jr. & S. N. Adams & Co., 4000 Westheimer St., duplex apartments in Glen Briar Addn. on San Felipe Rd. $1,000,000

▲ **Tex., Houston**—OFFICE—A. E. and John Olson, 3837 Del Monte St., 10 story brick, rein.-con. office. $2,000,000; department store, $425,000.

▲ **Tex., Houston**—APARTMENT—Owner, c/o Harry W. Freeman (atty.), Sterling Bldg., 125 unit masonry apartment, for University of Houston Personnel, Scott St. and Blodgett Ave. $1,250,000.

▲ **Tex., LaPorte**—APARTMENT UNITS—Marshall McDonald, 6901 "V" St., 125 apartment units, 29½ acre tract in Chocolate Bayou Rd., near Almeda-Genoa Rd. $1,500,000.

▲ **Tex., LaPorte**—APARTMENTS—Owner, c/o Harry W. Freeman (atty.), Sterling Bldg., Houston, 200-unit apartment, in area 1 block north of Main St. $1,350,000; 262 apartment units, four square blocks in area starting four blocks north of Main St., $1,750,000.

Va., Norfolk—SHOPPING CENTER—Paul H. Rose Corp., 718 W. 21 St., plans by Bernard B. Spigel, Kresge Bldg., PHR Center Shops Shopping Center addn. $750,000.

Ont., Renfrew—DWELLINGS—Cochshutt Aircraft Ltd., 14 Hall St., 100 dwellings. $900,000.

▲ **Ont., Toronto**—SHOPPING CENTER—Cloverdale Shopping Centre, c/o Ben Dunkelman, 8 Robinwood Ave., plans by Max W. Roth, 1015 Sherbrooke St. W., Montreal, Que., shopping center, junction of Hys. 5 and 27, west end of Toronto, 38-acre, incl. 60 shops, 110-room hotel, office space, parking lot. $5,000,000. Dr. E. G. Faludi, 24 Bloor St. E., consult. engr.

▲ **Ont., Toronto**—COMMUNITY DEVELOPMENT—Northview Developments, c/o S. Sorbaro, 1757 Eglinton Ave. West, satellite community, incl. 2,000 homes, duplex, apartment and row housing, shopping center, 360-acre in northwest area, Keele St. and Sheppard Ave. $25,000,000-$30,000,000.

▲ **Que., Hull**—SANATORIUM—Reverend Grey Nuns of the Cross, 7 Bruyere St., Ottawa, Ont., 150-bed sanatorium addn., Blvd. Tache. $2,000,000. CD 11/21/45.

INDUSTRIAL BUILDINGS

▲ **Conn., Stratford**—PLANT—Sikorsky Aircraft Div., United Aircraft Corp., South Ave., Bridgeport, helicopter manufacturing plant, Housatonic River, Far Hill Brook, near Merritt Parkway $17,500,000. Albert Kahn Associated Architects & Engineers, Inc., 345 New Center Bldg., Detroit, Mich., consult. engr. CD 10/26.

▲ **Ill., Cicero**—PLANT EXPANSION—Kropp Forge Co., 5101 Roosevelt Rd., plant expansion program, $5,500,000.

▲ **Ill., Chicago**—PLANT—Magill Weinsheimer Co., 1322 S. Wabash St., 1 story printing plant, **$1,000,000.** Klefstad Eng. Co., 4444 W. Montrose St., consult. engrs.

▲ **Ill., Glenview**—FACTORY—Signode Steel Strapping Co., 2600 N. Western Ave., Chicago, plans by Shaw, Metz & Dolio, 208 S. La Salle St., Chicago, Zone 4, factory, **$2,000,000.**

▲ **Mich., Warren**—PLANT—Thoroughbred Turf Club, Dick Frederick, 522 Free Press Bldg., Detroit, concrete racing plant, incl. grandstand, partly roofed, club house, race track, horse barns, jockey quarters 180 acre site Schoenherr and 12 Mile Rds. **$3,000,000.**

▲ **Neb., Hastings**—GRAIN ELEVATOR—Morrison & Quick, Hastings, grain elevator. **$1,000,000.**

▲ **Tex., Dallas**—PLANT—Dearborn Stove Co., Mercantile Bank Bldg., 150,000 sq. ft. stove mfg. plant, **$1,000,000.**

▲ **Tex., Texas City**—PLANT, etc.—Monsanto Chemical Co., Texas City, addnl. polyethylene production plant constr. 2nd phase of work. **$1,500,000;** repair shop, **$200,000;** addnl. drainage, **$75,000.** M. F. Gigliotti, c/o owner, field proj. engr. CD 4/28/47.

▲ **Wash., Issaquah**—PLANT—Washington Iron Works 1500 6 Ave. S., Seattle, metal working plant **$5,000,000.**

▲ **Ont., Windsor**—PLANT—Chrysler Corp. of Canada Ltd., E. C. Row, Pres., 245 Crysler Centre, addnl. plant expansion, **$21,000,000.**

UNCLASSIFIED

▲ **Minnesota**—PIPE LINE—International Pipelines, Inc., H. M. Baskerville, pres. 227 N. Colfax Ave., Minneapolis, 130 mi. pipe line from oil refinery at Wrenshall near Duluth to Twin Cities, **$4,350,000.**

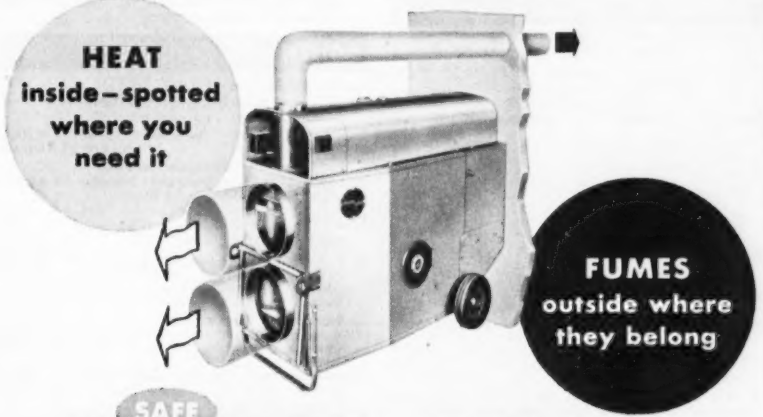
Texas—RURAL DISTR. LINES—Jasper-Newton Electric Co-operative, Kirbyville, 100 mi. electric distr. line and sys. imprvs., Jasper Co. **$514,000.**

Wash., Spokane—SHOPS—Great Northern Ry. Co., H. J. Seyton, ch. engr., 175 E. 4 St., St. Paul, Minn., remodel Hillyard shops, **$560,000,** install drop cable, **$170,000.**

▲ **W. Va., Huntington**—SHOPS—Chesapeake & Ohio Ry. Co., L. T. Nuckols, ch. engr., 823 E. Main St., Richmond 10, Va., reconversion of shops, **$1,400,000.**

▲ **Ont., London**—ARENA—City, City Hall, plans by T. C. McBride, c/o owner, and R. D. Schoales, 270 Cathcart St., 85x190x60 ft., high-ice surface arena, **$1,250,000.**

▲ **Ont., Toronto**—PRINTING PLANT—Murray Printing Co. Ltd. 192 Spadina Ave., plans by A. G. Facey, 991 Bay St., 1 story, no bsmt., 460x480 ft., concrete block, brick steel, printing plant near Barrie Hy. and Sheppard Ave. W., **$5,000,000.** Edgar A. Cross, 91 Bay St., Toronto, consult. engr.



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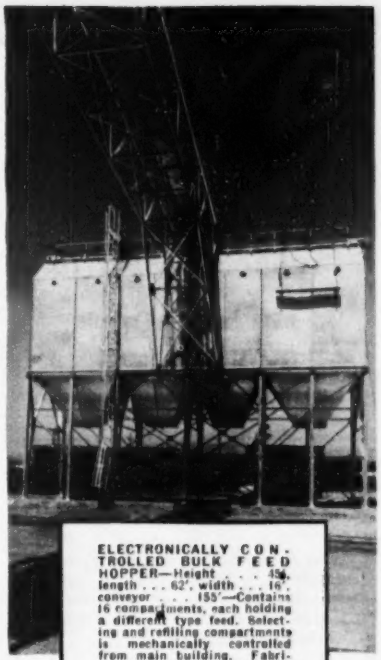

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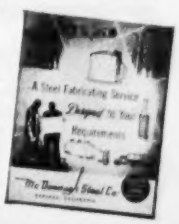

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
December 7 Connecticut December 8 Massachusetts

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Morrison-Knudsen Co., Inc., C. J. Maney Co., Inc., Peter Kiewit Sons Co.,** 4307 Chanin Bldg., 122 E. 42 St., New York, N. Y. LB **$11,917,808.** est. $12,000,000. Contr. 193, city water tunnel exten., Chestnut Hill, Newton and Malden, BOSTON, MASS. Commonwealth of Mass., Metropolitan Dist. Comn., 20 Somerset St., Boston, Mass. Bids Nov. 19. CD 10/19.

▲† **F. D. Rich Co.,** 332 Main St., Stamford, Conn. LB **$2,559,250,** est. $3,000,000. double cantilever maintenance hangar, Westover Air Force Base, ENG-19-016-54-32, CHICOPEE FALLS, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Nov. 20. CD 11/11.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
December 8 Maryland, New Jersey
STREETS AND ROADS
December 8 Maryland December 18 New York

BIDS ASKED—BUILDINGS

▲ **D. C., Wash.**—HOSPITAL—B.A. 12/8—Providence Hospital, 2 and D Sts. S.E., 350-bed hospital, 12 and Varnum Sts. N.E. $7,000,000. Plans deposit $110. Faulkner, Kingsbury & Stenhouse, Ring Bldg., archts. Former contract rescinded. CD 9/9, under CA.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
Corbetta Constr. Co., Inc., 220 E. 42 St., New York, N. Y., CA **$3,074,918,** est. $3,243,000. completing two bridges and long viaduct on Cross Bronx Expressway, FACBE 53-3, Bronx Co. Bids Nov. 5. CD 11/9, under LB.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
Johnson, Drake & Piper, Inc., 86 Trinity Pl., New York 6, N. Y., LB **$6,543,397,** c. conc. pavement, two at 25 ft. variable width, 9.95 mi.; asph. conc. Type 1a, opt. 2.85 mi.; misc. work 0.08 mi.; five hy. seps. comp. I-beams 217.2 ft., 194.5 ft., 175.8 ft., 186.2 ft. and 207.4 ft., 2 bridges, twin box 25 ft. and 25 ft., 2 bridges, comp. I-beams 57 ft. and 57 ft., altering existing railroad bridge, 5.94 mi. Access, 6.94 mi. Hy., Palisades Interstate Park-Goshen Pts. 1A and 1B, Central Valley-Turners, SH 115; Highland Mills-Monroe S.H. 413; Monroe-Washingtonville, S.H. 9057, Proj. fi-IG-1050 (7), Cont. 1, F-1050 (8), Cont. No. FASH-53-15, FARC. 53-129, Orange Co. Bids No. 19. CD 10/28.

▲ **Beacon Constr. Co.,** 102 Hanover St., Boston, Mass. CA **$2,229,000,** est. $2,380,000. 40 utility bldgs., islands and canopies for toll stations, along New York State Thruway between New York City and Buffalo, Contr. TUB 53-1, Albany, Greene, Schenectady, Herkimer, Madison, Montgomery, Oneida, Cayuga, Onondaga, Seneca, Genesee, Monroe, Ontario, Erie, Orange, Rockland, Ulster and Westchester Counties, NEW YORK. Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, N. Y. Bids No. 5. CD 11/9, under LB.

▲ **NEW JERSEY**—New Jersey Hy. Auth., State Hy. Office Bldg., 1035 Parkway Ave., Trenton.
Poirier McLane Corp., 33 W. 42 St., New York, N. Y. LB, **$6,866,065,** 1.95 mi. Garden State Parkway from Arlington Place, E. Orange to D.L.&W.R.R., Bloomfield, Contract No. 46, Essex Co. Bids Nov. 19. CD 10/30.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,
H. R. Miller Co. Inc., Box 1235, Lancaster, Pa., LB **$2,018,685,** constr. 33,160 ft. divided road of rein.-conc. pavement, 2 lanes each 20 ft. wide; 20 ft. earth divisor, T. R. 22, Berks Co.;
Central Pennsylvania Quarry, Stripping & Constr. Co., P.O. Box 378, Hazleton, Pa., LB **$3,581,477,** constr. 19,414 ft. divided road with crushed aggregate base and bit. surf. variable in width, 3 deck girder bridges and an I-beam bridge, T. R. 100, Chester and Montgomery Counties;
Fred H. Ewing, Inc., 405 W. Main St., Corry, Pa., LB **$1,857,152,** widn. and overlay 49,345 ft. existing road with crushed aggregate base and bit. surf. variable in width, one I-beam and six rein.-con. bridges, T.R. U. S. 20, Erie Co. Bids Nov. 19. CD 11/2.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **John Rosenblum, Inc.,** 1860 Broadway, New York 23, N. Y. CA **$2,040,000.** JUNIOR HIGH SCHOOL 258, Halsey and Macon Sts., Tompkins and Marcy Aves., BROOKLYN, N. Y. Director Bureau Constr., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Nov. 10. CD 11/5.

▲ **Planet Constr. Co.,** 11 W. 42 St., New York 36, N. Y. LB **$2,038,000.** JUNIOR HIGH SCHOOL 117, Willoughby Ave. between Kent and Franklin Aves., BROOKLYN, N. Y. Director Bureau Constr., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Nov. 18. CD 10/22.

▲ **Caristo Constr. Corp.,** 26 Court St., Brooklyn 2, N. Y. LB **$2,125,000.** JUNIOR HIGH SCHOOL 135, Wallace, Mace, Holland and Warring Aves., NEW YORK, N. Y. Bd. Educ., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Nov. 19. CD 10/26.

▲ **Clover Hill Homes,** c/o Teas & Steinbrenner, archts., Homeland Blvd., Malverne, N. Y. Owner Builds. **$3,000,000.** 200 HOUSES on tract on Central Park Rd., south of Old Country Rd., PLAINVIEW, N. Y.

▲ **Maplewood Estates Homes,** c/o A. H. Salkowitz, archt., 37-60, 82 St., Jackson Heights, N. Y. Owner Builds. **$5,000,000.** 300 HOUSES, on tract on Old Country Rd., east of South Oyster Bay Rd., PLAINVIEW, N. Y.

▲ **Fred J. Brotherton, Inc.,** 185 Atlantic Ave., Hackensack, N. J., CA, Total est. **$30,000,000.** ASSEMBLY PLANT, MAHWAH, N. J. Ford Motor Co., Rouge Plant, 3000 Schaefer St., Dearborn, Mich. Bids Nov. 5. CD 10/28.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
December 11 Kentucky, Tennessee December 18 Alabama
December 22 Florida January 15 Tennessee
STREETS AND ROADS
December 11 Kentucky, Tennessee December 18 Alabama
December 22 Florida

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **J. F. Pritchard & Son Constr. Co.,** 908 Grand St., Kansas City, Mo., CA, **$2,210,000,** gas compressor station, CEREDO, W. VA. United Fuel Gas Co., Lipscomb Bldg., Charlestown, W. Va. CD 3/13.

▲ **Southeastern Electric Constr. Co.,** Andalusia, Ala., CA. **$627,858,** Contract 6, natural gas distr. systems in Elba, Enterprise and New Brocton. Bids Nov. 18. CD 11/12;
Southeastern Contg. Co., 2809 Balmoral Rd., Birmingham, Ala., CA, **$822,138,** Contract 5; distr. sys. in Opp, Andalusia and Gantt;
C. P. Bamberg, 416 Alabama St., Montgomery, Ala., CA, **$178,106,** Contract 4, distr. sys. in Luverne Rutledge, Glenwood and Brantley;
M. R. Thomason & Holt & Thomason, P.O. Box 1847 Montgomery, Ala., CA, **$4,491,132,** Contract 1, southwest transmission lateral approx. 175 mi. 2- to 19-in. lines;
Arthur Pew & E. N. Murray, Buena Vista, Ga., CA, **$443,188** Contract 3, distr. sys. in Fort Deposit and Greenville, ALABAMA. Southeast Alabama Gas District, City Hall, Andalusia, Ala. Grand total $6,562,422. Bids Nov. 16. CD 11/12.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **J. A. Jones Constr. Co.,** 209 W. 4 St., Charlotte, N. C., CA, **$2,000,000,** STORE, JACKSONVILLE, FLA. J. C. Penney Co., 330 W. 34 St., New York, N. Y. W. Kenyon Drake, Rogers Bldg., Jacksonville, Fla., archt.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
December 8 Wisconsin
STREETS AND ROADS
December 8 Ohio

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—Ohio Turnpike Comn., 139 E. Gay St., Columbus,
Wright Constr. Co., 504 25th Ave., Columbus, Ga., LB **$8,990,876,** (Oct. 1, 1955 completion);
Bero Eng. & Constr. Corp., McKinley Bldg., Buffalo, N. Y. LB **$9,569,370,** (Nov. 30, 1954 completion), Sect. 4, grading, drainage, structures and paving approx. 3.7 mi. from point approx. 2,000 ft. west of Turner Rd. in Mahoning Co. and extending eastwardly to point approx. 4,500 ft. east of State Rte. No. 46, incl. three single bridges of five spans each, three twin bridges of three spans each, six rein.-con. box culverts for drainage and one rein.-con. retaining wall; Sect. 5, grading, drainage, structures and paving approx. 5.3 mi. from point approx. 1,480 ft. west of intersection of Gladstone Rd. and St. Rte. 45 in Mahoning Co. and extending eastwardly to point approx. 2,000 ft. west of Turner Rd., incl. three single steel beam bridges, three twin steel beam bridges, one single steel girder bridge, one twin steel girder bridge and seven rein.-con. box culverts for drainage, the bridges are of from three to six spans each, Mahoning Co.;

Peter Kiewit Sons Co., 1024 Omaha Natl. Bank Bldg., and **Condon-Cunningham Co.**, 4229 Lafayette St., Omaha, Neb., LB **$6,277,853**, Sect. 39, grading, drainage, structures paving approx. 3.9 mi. from point approx. 1,000 ft. east of Four Mile House Rd. and extending eastwardly to Sandusky River, incl. four single bridges, four twin bridges and four box culverts for drainage, all bridges are steel beam bridges of from one to four spans each, Sect. 40, grading, drainage, structures, paving, approx. 3.9 mi. from point approx. 200 ft. west of Hessville Rd. and extending eastwardly to point approx. 1,000 ft. east of Four Mile House Rd. Incl. four single bridges, two twin bridges and two box culverts for drainage, all bridges are steel beam bridges of from one to four spans each, Sandusky Co. Bids Nov. 19. CD 10/21.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **The Christman Co.**, 408 Kalamazoo Bldg., Lansing, Mich. CA **$3,705,395**. 4 story, brick, steel, concrete LIBRARY, EAST LANSING, MICH. State, A. N. Langius, dir. State Bldg. Dpt., Lansing, Mich. CD 11/24, under LB.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
December 15 Texas
STREETS AND ROADS
December 15 Texas

BIDS ASKED—BUILDINGS

▲ **Tex., Houston**—HIGH SCHOOL—B.A. 12/10—Houston Independent School Dist., 1600 Washington St., 3 story, 180,000 sq. ft. brick on tile backing, concrete and steel frame Senior High School, gymnasium, swimming pool, Bellaire area. $2,500,000. Plans deposit $50. Extended date. Lloyd & Morgan, 4605 Montrose St., archts. Milton McGinty, 2425 Ralph St., co-op. archt. I. A. Naman, 2027 Harold St., Walter P. Moore, 2 Pinedale St., Still, Wildman & Crockett, 3030 Louisiana St., engrs. CD 11/17.

▲ **Tex., Lubbock**—HIGH SCHOOL—B.A. 12/22—Lubbock Independent School Dist., Lubbock, Junior-Senior High School. $2,377,060. Atcheson & Atkinson, Sanford Bldg., archts. Zumwalt & Vinther, 1807 Mercury Bank Bldg., Dallas, engrs. CD 11/6/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Edw. E. Morgan Co., Inc.**, Fondren Station, Jackson, Miss. and **Jones & Gillis**, Clarksdale, Miss. LB **$6,148,684**, est. $7,500,000. completion of Webster Dam, Webster Unit, Solomon Division, Missouri River Basin Proj., South Fork of Solomon River, near Webster, Rooks Co., Spec. DC 4052, KANSAS. Bureau Reclamation, Dpt. Interior, Stockton, Kan. Bids Nov. 17. CD 10/1.

▲ **Tellepsen Constr. Co.**, P.O. Box 2536, Houston, Tex. LB **$2,405,000**, sewage treatment plant; LB **$138,500**, est. $90,000, Proj. 8, sanitary sewer collection extens. and some imprvs. to existing treatment plant, BEAUMONT, TEX. City, Beaumont, Tex. George J. Schaumburg, 2678 Laurel Ave., Beaumont, Tex., engr. Bids Nov. 17. CD 11/4.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
December 17 California
STREETS AND ROADS
December 17 California

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **WASHINGTON**—State Hy. Dpt., Seattle, **General Constr. Co.**, 3840 Iowa St., Seattle, Wash., LB, **$1,387,655**, piers for bridge over Duvamish River, 1 Ave. S., King Co. Bids Nov. 24. CD 10/29.

▲† **Willamette Iron & Steel Co.**, 2860 N.W. Front St., Portland, Ore., LB **$2,335,750**, intake structures and gate structures, The Dalles Dam, Civeng-35-026-54-5, OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids Nov. 19. CD 10/29.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Haas & Haynie**, 275 Pine St., San Francisco, Calif., CA, **$6,318,000**, SHOPPING CENTER, Macy's Department Store in Hillsdale development, SAN MATEO, CALIF. David G. Bohannon, c/o Welton, Beckett & Assocs., archts., 173 Maiden Lane, San Francisco, Calif. Awarded Nov. 16. CD 11/5, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
December 8 Manitoba

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Dominion Bridge Co. Ltd.**, 2450 Boundary St., Vancouver, B. C., CA, **$3,116,061** supply and delivery of pipe;

Dresser Mfg. Co. Ltd., 629 Adelaide St., West, Toronto, Ont., CA, **$153,475**, for coupling 187,000 ft. 36 in. steel pipe for Buffalo Pound Lake Water line Proj., REGINA, SASK. City, City Hall, Regina, Sask. A. Shattuck, c/o owner, engr. Awarded Nov. 19. CD 3/25.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Empire Constr. Co.**, York Downs Rd., Toronto, Ont., Owner Builds. **$2,250,000**, 228-suite APARTMENT BLOCK, Bathurst St. near Wilson Ave., TORONTO, ONT. CD 10/27.

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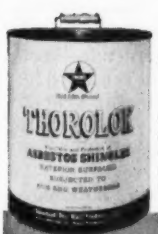

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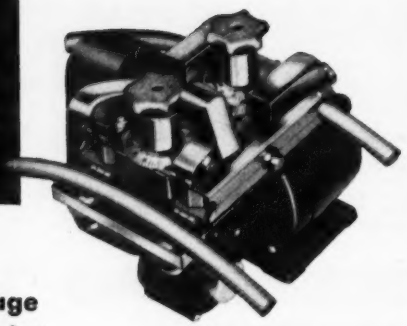

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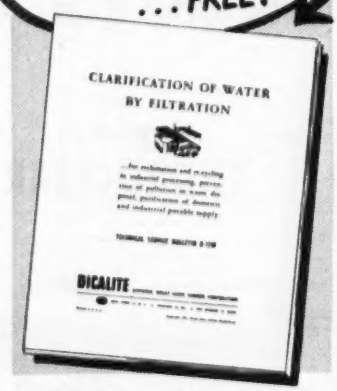

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UNIT PRICES

Highway department buildings, Massachusetts

Average costs for four types of highway department administration and service buildings have been made available by G. G. Love, acting maintenance engineer, Massachusetts Department of Public Works. Two of the buildings, the foreman's garage and district administration building will serve as models for a long-range building program of similar structures throughout the state.

Traffic and maintenance depot—Two buildings are being constructed at Wellesley, Mass., a maintenance and traffic building and a laboratory, to service the entire state.

The $2,104,906 contract for the building was awarded to Canter Construction Co., Brookline, Mass. A. J. Carpenter, Boston, is the architect.

The maintenance and traffic building contains 162,500 square feet and utilizes brick with concrete block backup, a steel frame, and limestone at the entrance.

The cost of the two buildings combined is approximately $0.51 per cu ft.

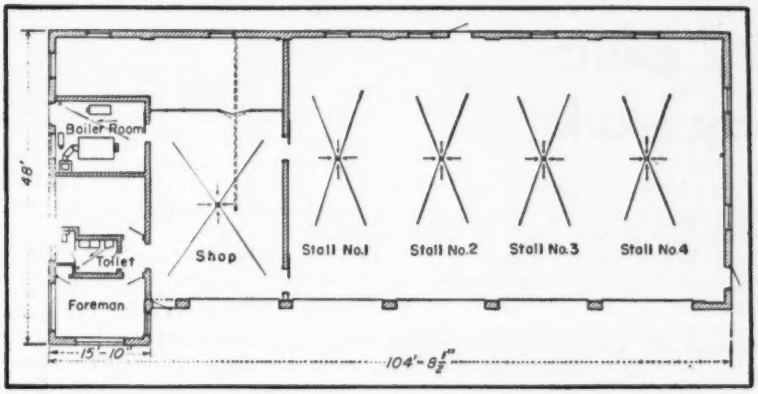
Foreman's garage—Plans consisting of single, double and triple garages of both concrete block and brick construction are available.

Walls will be 12-in. thick and roof framing of long span joists. This eliminates the necessity for interior columns and increases the actual storage capacity of the area.

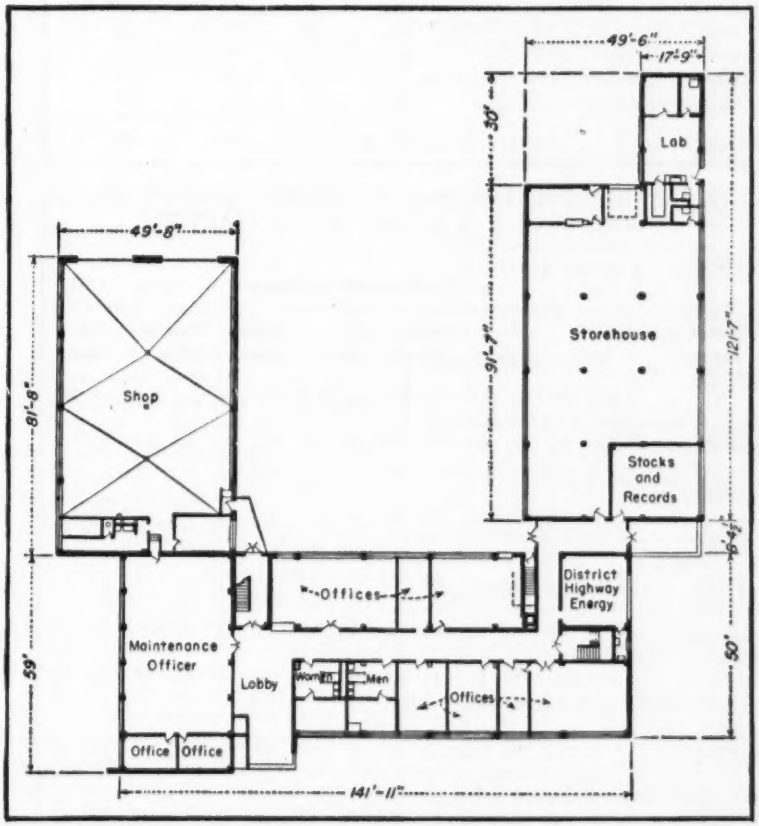
Two concrete block garages already constructed in 1950 and 1952 cost $0.40 and $0.60 per cu ft respectively. Future building costs are estimated at $0.63 per cu ft for concrete block and $0.69 per cu ft for brick. The increase is due in part to the general upward trend of prices and in part to structural and mechanical improvements.

District administration building—Although the low bid entered on the Worcester administration building was approximately $0.90 per cu ft, the bid was too far below the next three to be used as a sound basis for estimating future cost. Therefore, an average of the next three bids was taken resulting in an estimate of $1.04 per cu ft for these buildings. A. G. Manaselian, Boston, is the architect.

The future buildings will contain 332,000 cu ft, against about 296,000 cu ft in the Worcester building. They will have a steel frame and walls backed with concrete block. The



FOREMAN'S GARAGE—Single garage to be used as a model for future garages throughout the state. Plans for double and triple garages also available.



DISTRICT ADMINISTRATION BUILDING—332,000 sq ft headquarters to be built for approximately $1.04 per cu ft.

building will be U-shaped, with two stories of offices and a one story wing housing a shop, storehouse and laboratory.

Buildings are being erected under contracts administered by the Massachusetts Dept. of Public Works, John A. Volpe, commissioner.

Estimated costs—Mass. Hwy. Dept. buildings

Type of building.....	Cu ft	Cost per cu ft	Total cost
Maint & traffic bldg.....	3,900,000	$0.48	$1,872,000
Laboratory building.....	208,000	1.10	228,800
Foreman's garage concrete block.....	79,365	0.63	65,000*
brick.....	79,710	0.69	70,000*
District admin bldg.....	332,000	1.04	345,280

*Includes $15,000 for complete grading & paving of driveways & work area in rear of building.

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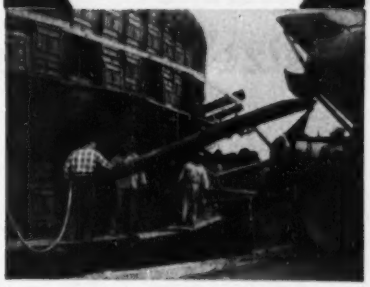

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Contractor capacity gains: by size, by area, by work

ENR's 1953 survey of contractor capacity showed that heavy construction firms can handle about 50% more work than they could in 1949, but are only doing about 38% more dollar volume of business (ENR Aug. 20, p. 21). Now, for those who are interested in more details of this survey, ENR breaks down its capacity figures by regions, by type of work, and by size of contractor. It also shows how the reasons which contractors gave for their gains in capacity vary with the size of the company.

Look, for instance, at Table 1. On an over-all U. S. basis, there is very little difference between the three size groups in the percentage of contractors who reported gains in capacity. There is some difference among various regions in the rate at which small and large contractors are growing.

In the South, Far West, and Middle Atlantic, the A-3 (smaller) companies are growing faster than the large firms, in terms of dollar volume capacity. But in New England, the Middle West, and in the West of Mississippi the larger contractors are outpacing their smaller competitors.

• **Big gainers**—Now look at Table 2, which shows the percentage of contractors who reported gains in capacity of 50% or more, broken down by region and by size. These percentages are based on all contractors who answered the survey, whether or not they reported a increase in their capacity.

The table shows that over the U. S. as a whole, a slightly higher percentage of smaller (A-3) contractors

(1)—% OF CONTRACTORS REPORTING HIGHER CAPACITY

	Size of contractor			
Region	**A1**	**A2**	**A3**	**A11**
New Eng.	100	100	83	91
Mid. Atlantic	81	92	88	87
South	69	86	90	89
Middle West	91	87	81	84
W. of Miss.	87	83	79	81
Far West	86	93	94	92
U. S. total	**87**	**88**	**85**	**86**

A1: $1,000,000 or more volume
A2: $500,000 to $1,000,000
A3: $100,000 to $500,000

(2)—% OF CONTRACTORS REPORTING 50% OR MORE GAIN IN CAPACITY

Region	**A1**	**A2**	**A3**
New Eng.	40	33	33
Mid. Atlantic	37	15	37
South	22	27	44
Middle West	52	30	28
W. of Miss	31	37	33
Far West	24	44	37
U. S. total	**32**	**32**	**35**

(3)—% OF CONTRACTORS REPORTING 50% OR MORE GAIN IN CAPACITY, GROUPED BY SIZE AND BY TYPE OF WORK

Type of work	**A1**	**A2**	**A3**	**All contractors**
Waterworks	30	40	54	45
Sewerage	36	26	30	31
Bridges	37	23	26	30
Highways	30	42	31	33
Earthwork, waterways	19	33	33	26
Airports	25	33	50	37
Unclassified	23	31	44	35
All types	**32**	**32**	**35**	**34**

(4)—FACTORS CONTRIBUTING TO HIGHER CAPACITY—BY REGIONS OF U. S. & BY SIZE OF CONTRACTOR

Factors boosting capacity	**% of contractors* reporting**															
	U. S. total		**New England**		**Middle Atlantic**		**South**		**Middle West**		**West of Miss.**		**Far West**	
	A1	**A3**	**A1**	**A3**	**A1**	**A3**	**A1**	**A3**	**A1**	**A3**	**A1**	**A3**	**A1**	**A3**
More equip.	88	83	80	80	100	87	84	92	95	77	82	81	83	**77**
Supervisory personnel	70	70	100	50	82	66	63	72	71	77	62	67	72	**71**
More working capital	69	70	20	70	86	63	69	66	76	73	65	69	61	83
Better equip.	64	56	80	60	55	58	63	55	72	54	65	61	61	56
More field units	48	36	60	40	41	53	41	30	62	39	50	37	50	27
Complete work faster	41	42	60	50	23	39	47	44	52	43	44	41	28	38
Better mat'ls. supply, flow	38	36	20	0	32	37	50	47	29	36	44	37	28	27
Stable labor following	21	24	0	30	18	26	22	24	24	18	27	24	17	27
More efficient labor	**13**	**17**	0	20	5	11	13	21	19	11	21	20	6	15
Good weather	**14**	**15**	0	20	5	5	16	13	24	14	21	22	6	11

* Includes only those contractors reporting higher capacity in '53 compared with '49

reported these big boosts in capacity than those in the A-1 and A-2 groups.

This is no surprise. For contractors who do an annual volume of from $100,000 to $500,000 start from a smaller base than larger firms. In other words, a given increase in capacity means more to them percentage-wise than to large firms.

But there is no consistent regional pattern for this over-all better showing by smaller contractors. Table 2 shows that only in the South are the smaller firms gaining faster than the A-1 and A-2 groups. And in other regions, the three groups varied widely.

In New England, for instance, the A-1 group was ahead of the other two, and in the Middle West it was far ahead. In the Far West, A-3 contractors reported a higher percentage of big gains in capacity than the A-1 group, but not as much as A-2 firms.

• **Type of work**—Now let's look at how reported increases in capacity break down by type of work in which contractors are engaged. Over-all figures (not given in tables) show that from 90% to 92% of contractors in waterworks, sewerage, bridges, and unclassified (both private and public) increased their capacity. Anywhere from 81% to 85% of firms in the categories of highways, airport construction, and earthwork and waterways reported gains. In all these types of work except unclassified, a higher percentage of contractors in the A-1 group reported gains in capacity than the smaller outfits.

Table 3 shows how this breaks down by size of firm, for those contractors reporting really substantial gains of 50% or more. Here, in most categories, a higher percentage of the smaller contractors (A-3) have made these large capacity gains.

The last column in Table 3 shows that a much higher percentage of contractors reported really big gains in capacity (50% or more) in the waterworks field than in any other.

• **Reasons**—What factors helped contractors increase capacity, and what factors limited capacity? The chart (above) shows that the major reasons for both large and small contractors alike were: more equipment, more working capital, better supervisors, and better equipment, in that order. It is interesting that better availability of materials was rated far down the list.

Altogether, 86% of the contractors who replied to ENR's survey reported a higher capacity than in 1949. About 12% reported that their capacity was the same as in 1949, and only around 2% reported less capacity.

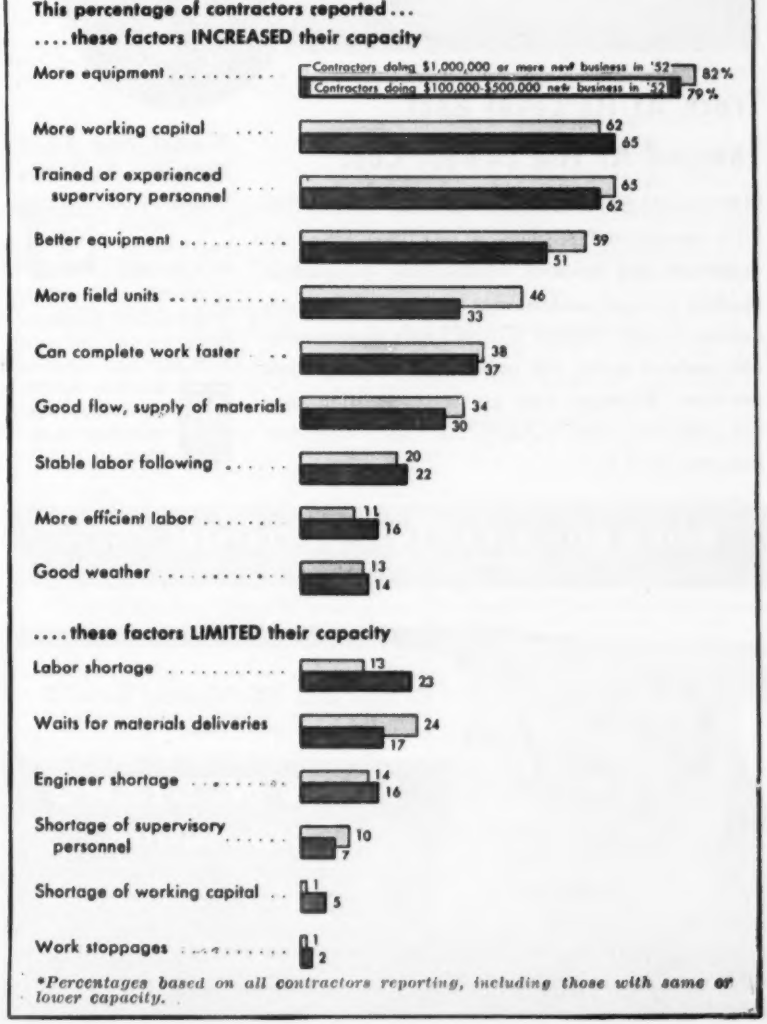
Among factors limiting capacity, the three most important were: labor shortage, delays in delivery of materials, and shortage of engineers. It might have been expected that small builders suffered more from shortages of labor and engineers than larger firms. But it is interesting that a higher percentage of big contractors complained of trouble with delivery of materials than did smaller ones.

Now look at Table 4, which breaks down the factors which increased capacity on a regional basis and also again provides a comparison between the A-1 and A-3 firms. There are some interesting variations from the U. S. norm in different regions.

For instance, all A-1 contractors in the Middle Atlantic area rated "more equipment" as a factor in increased capacity, while in most others areas about 80% to 85% of large builders mentioned it as a factor.

• **New England**—Every A-1 firm in the New England area rated "better supervisors" as a factor, while only 50% of the A-3s in the same region considered it worth mentioning. In other ways, too, New England varied quite sharply from other areas. Big contractors, here—in a region where banks

Contractors report—by size of firm—reasons for higher capacity and factors limiting capacity *


This percentage of contractors reported...
....these factors INCREASED their capacity
Contractors doing $1,000,000 or more new business in '52
Contractors doing $100,000-$500,000 new business in '52
More equipment 82% 79%
More working capital 62 65
Trained or experienced supervisory personnel 65 62
Better equipment 59 51
More field units 46 33
Can complete work faster 38 37
Good flow, supply of materials 34 30
Stable labor following 20 22
More efficient labor 11 16
Good weather 13 14
....these factors LIMITED their capacity
Labor shortage 13 23
Waits for materials deliveries 24 17
Engineer shortage 14 16
Shortage of supervisory personnel 10 7
Shortage of working capital 1 5
Work stoppages 1 2

**Percentages based on all contractors reporting, including those with same or lower capacity.*

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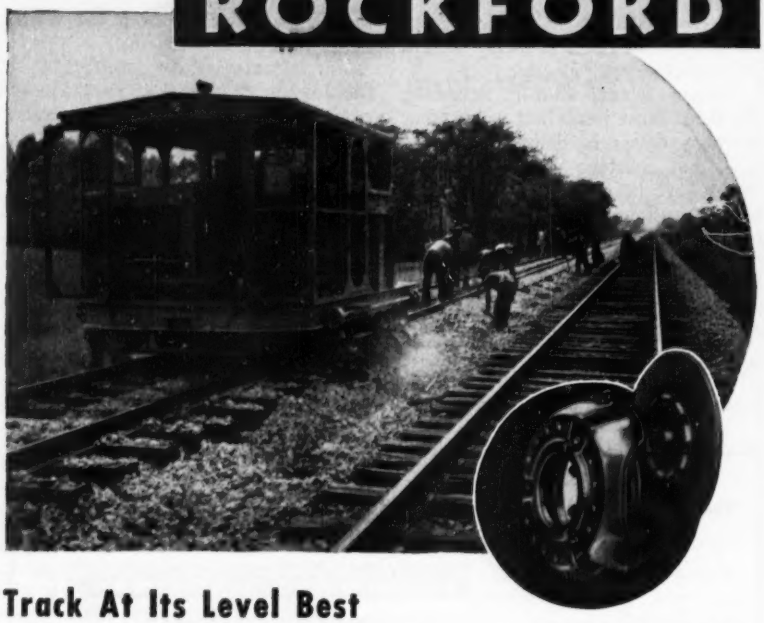

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BUSINESS AND FINANCE

often have surplus funds to lend—rated "more working capital" as a very minor factor. But they considered "better equipment" as more important than did builders anywhere else. A higher percentage of New England builders than contractors in practically every other group also reported they could "complete work faster." They considered availability of materials less important than other builders did. Not one of the big New England contractors in the survey considered that a stabler labor following or more efficient labor helped his capacity.

Improved availability of materials was considered most important by builders in the Middle West and in the West of Mississippi area. The regions rating it lowest were New England and the Far West.

Business briefs . . .

• **Savings & loan associations** will join the National Association of Home Builders and the National Association of Real Estate Boards in slum rehabilitation, says Charles L. Clements, president of the U. S. Savings and Loan League.

• **Thompson-Starrett Co., Inc.,** lost $120,000 in the five months between April 30 and Sept. 30, and probably will lose money for the year ending next April 30. That's the word at the annual meeting from President J. R. Van Raalte, who also says the company is considering a merger. The Company has obtained no new contracts since April 30.

• **Indiana Toll Road Commission** plans to offer about $280 million of revenue bonds in mid-December to finance its projected toll road (ENR Oct. 29, p. 23).

Corrections

Corrections to weekly contract award table on page 63 of the November 26, 1953 ENGINEERING NEWS-RECORD.

Under contracts by type of work, the percent change 1952-1953 column should read: Waterworks, +4%; sewerage, +43%; bridges, +61%; highways, +22%; earthwork, waterways −26%; public buildings, excluding housing, −62%; housing, public, −37%; housing, private, +16%; commercial, +50%; industrial, +1%; unclassified, +26%; total, −8%.

Activity This Week

As reported to ENR
(in millions of dollars)

Amount of contracts let

	This Week	Cumulative 49 wks 1953	1952	% chge
Federal ...	$11.9	$1,353.1	$4,415.4	−69
State and Municipal	105.7	4,688.4	3,908.0	+20
Total pub. .	117.6	6,041.5	8,323.4	−27
Total priv..	176.8	7,912.8	6,803.1	+16
U. S. Total..	**$294.4**	**$13,954.3**	**$15,126.5**	**−8**
Contracts by type of work				
Waterworks	$18.5	$232.5	$209.5	+11
Sewerage ..	6.2	406.7	288.2	+41
Bridges ...	11.9	644.4	399.5	+61
Highways .	24.3	1,670.5	1,371.6	+22
Earthwork, Waterways	5.4	341.0	468.2	-27
Buildings: Public, excl. hsg.	38.5	1,615.0	4,209.6	−62
Housg., pub.	5.5	369.0	583.6	−37
Housg., priv.	66.5	3,291.3	2,863.6	+15
Commercial	40.7	1,107.6	784.0	+41
Industrial..	51.1	2,660.4	2,642.9	+1
Unclassified	25.8	1,615.4	1,305.8	+24
Total	**$294.4**	**$13,954.3**	**$15,126.5**	**−8**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

	Week of Nov. 26 1953	Cumulative 48 Wks 1953	% chge 1952-53
Corporate securities .	83.6	3,895.5	+14
State and municipal: Excluding housing	190.6	4,044.7	+45
Housing	....	262.8	−13
Federal loans.....	0.1	107.5	−68
Federal aid	....	770.9	−40
Total non-federal	**274.4**	**9,080.7**	**+23**
Federal approp.: In U. S.....	....	1,566.7	−79
Outside U. S.	....	28.9	−85
Total new capital...	**274.4**	**10,676.3**	**−29**

ENR indexes		Base Years = 100 1913	1926	1949
Constr...	Nov. '53	610.92	293.67	128.07
cost ...	Oct. '53	610.76	293.59	128.04
Bldg.....	Nov. '53	436.34	235.87	124.03
cost ...	Oct. '53	436.31	235.86	124.03
Volume ..	Oct. '53	528	215	153
	Sept. '53	487	198	141

BRIEFS from The YEOMANS GUARD

Pneu-Pump Proves Low-cost Solution to Small-volume Pumping Problems

It's the new Pneu-Pump; a pneumatic pump that's simple to manufacture, automatic in operation, practically foolproof, has only one moving part.

The Pneu-Pump is immune to high temperatures, operates for years without attention; and is priced agreeably low.

You'll find it a quick, permanent answer to pumping extremely small volumes of water, oil, mud, paint, tar, acids, alkalis, sludge, molten metals, molten salts, slurries, abrasive liquids and any other "problem child" that pesters you.

☐ **Please send Pneu-Pump Bulletin.**

Here's what *you get* . . . when you install a YEOMANS PUMP

This patriarch's biography reads as follows:

- installed 1912
- in the Ansley Hotel Atlanta, Georgia
- a duplex bilge pump to handle drainage
- repairs: only recorded service is replacement of vertical thrust bearing early in 1953

Any Yeomans user must indeed find vast satisfaction in this exciting proof of his sound judgment; and if you think we are proud of such equipment bearing the Yeomans name, you are absolutely right.

Contemporary descendants of those magnificent "old timers" are Yoemans Heavy Duty Bilge Pumps and Screenless Ejectors—and as fine equipment as money can buy.

☐ **Send Bulletin 3-8000**

18,000 gpm of FLY ASH and ASHPIT DRAINAGE Handled by YEOMANS PUMP

Moral: Bring Tough Problems to Yeomans.

Late in 1950, four Yeomans vertical submerged centrifugal pumps were installed in what is said to be the largest* electric power generator station in the United States—for removal of fly ash and ashpit drainage. The pumps are mixed-flo units, of 14-inch size and 4500 gpm capacity—for a total of 18,000 gpm.

Because of the highly abrasive character of the water with its heavy ash content, the pumps are of special construction—including non-clog wear-resistant impellers; shafts, shaft sleeves, casings and impeller wearing rings of special material; and corrosion-resistant bearings.

Performance: Wholly satisfactory

Aside from the immense satisfaction derived from solving a truly "difficult" problem like this, it is exceedingly interesting to note accelerating pace at which industry is referring its perplexing handling problems to specialists like ourselves. Production men's chief concern with any proposed unit is—"Will it do our job dependably?".

In the light of substantial savings in time, labor and maintenance, the original equipment cost is relatively unimportant.

Have you a "problem" material?—write us.

* Our authority: that eminent firm of electrical and power plant engineers, Sargent & Lundy.

These stories, and others, are told in full in our periodical, The Yeomans Guard. It's full of news and useful information about the pumping of materials and the treatment of wastes, both domestic and industrial. A copy of the current issue is yours for the asking. Contact your local Yeomans Representative—listed in the telephone book yellow pages under "Pumps"—or write direct.

YEOMANS BROTHERS COMPANY

1999-1 N. RUBY STREET, MELROSE PARK, ILLINOIS

Manufacturers of: Centrifugal Pumps and Pneumatic Ejectors for Buildings, Municipalities, and Industrial Applications, and a Full Line of Waste Treatment Equipment.

Keep jobs on Schedule with TULSA* WINCH...

To get equipment where it's needed, when it's needed, safely and efficiently, is no longer a major problem with contractors . . . they rely on Tulsa Winch to do the job. Whether you're moving power shovels or light timbers, there is a Tulsa Winch for every make and model of truck and crawler tractor in capacities from 6,500 to 80,000 lbs.

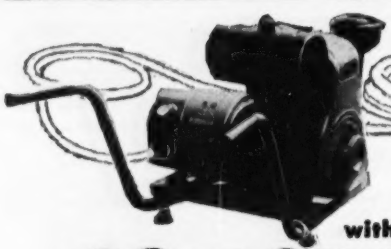
Tulsa* Winch
TULSA, OKLAHOMA — DIVISION OF VICKERS Inc.

*Reg. U. S. Pat. Off.

Save Costs!

PLACE CONCRETE FASTER...

in any FORM... Get BETTER RESULTS



Maginniss HI-LECTRIC POWER TOOLS

with **HI-LECTRIC**

CONCRETE VIBRATORS

The Maginniss HI-LECTRIC Vibrator places concrete with a maximum bond for greatest strength. Patented construction with electric motor in head develops up to 10,000 V.P.M. yet is so light in weight that one man, alone, can vibrate 1½" slump and up to 3" aggregate faster than with heavier units. No flexible shafts or power units to lug around. The result is faster placing and reduced labor cost. "The greatest improvement in concrete vibrators in a decade." Write.

Maginniss POWER TOOL CO. Mansfield, Ohio

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.50 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: December 22, 1953

Second Feeder for Navigation Aids at Runway 4-22

THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT
CONTRACT NA-260.001

Sealed proposals for the furnishing and installation of a 5,000 volt feeder and equipment for navigation aids at Runway 4-22 at Newark Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1111, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M., Tuesday, December 22, 1953, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1111, and copies will be furnished upon deposit of $50.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, December 3, 1953

Bids: December 18th, 1953

New York State Road Work

Sealed Proposals for the improvement and Repair of Ditch No. 8-B (Big Island Channel) and Ditch No. 21 (Pumpkin Swamp Channel), which form a part of Quaker Creek in the Towns of Goshen and Warwick, Orange County, in Drainage District No. 3 the Wallkill Valley Drainage Improvement District; will be received by Henry A. Cohen, Director, Bureau of Contracts and Accounts, Department of Public Works, The Governor Alfred E. Smith State Office Building, Albany, N. Y. on behalf of the Department of Public Works, until 10:30 o'clock A.M., Eastern Standard Time on Friday, December 18, 1953, at which time and place they will be publicly opened and read. The approximate amount of this work is $36,300.

Proposals shall be endorsed on the envelope "Proposal for Wallkill Valley Drainage Improvement District, District No. 3, Construction Project C, Quaker Creek, Big Island Channel (Ditch No. 8-B) and Pumpkin Swamp Channel (Ditch No. 21)" and addressed to Henry A. Cohen, Director, Bureau of Contracts and Accounts, The Governor Alfred E. Smith State Office Building, Albany, N. Y. and shall be accompanied by a deposit in the form of draft or certified check, upon some National or State Bank or Trust Company within the State in good credit and payable on sight to the Water Power and Control Commission, in the amount of five (5) percentum of the total amount of the proposal as a guarantee that the bidder will enter into a contract if it be awarded to him, within ten (10) days after notice of such award.

The blank spaces in the proposal must be filled in in ink and no change shall be made in phraseology of the proposal. Proposals that carry any omissions, erasures, alterations or additions may be rejected as informal. Successful bidder will be required to give a bond conditioned for the faithful performance of the contract and a separate bond for the payment of the laborers and materialmen, each bond in the sum of one hundred (100) percentum of the amount of the contract. Corporations submitting proposals shall be authorized to do business in the State of New York. Drawings and specifications may be examined free of charge at the following offices:

Henry TenHagen, Deputy Chief Engineer
The Governor Alfred E. Smith State Office Building, Albany, New York
State Architect, State Office Building, 270 Broadway, New York City
J. S. Bixby, Dist. Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.
J. C. Thompson, Executive Engineer, Water Power and Control Commission, 110 State Street, Albany 7, New York

Drawings and specifications may be obtained from Henry A. Cohen, Director, Bureau of Contracts and Accounts, The Governor Alfred E. Smith State Office Building, Albany, New York upon deposit of $10.00 for each set.

Refund in full will be made to bidders for one set of plans and specifications returned in good condition within 30 days of award of contract or the rejection of the bids. A 50% reimbursement will be made for the return, in good condition, of all other sets of the plans and specifications within 30 days following the award of the contract or the rejection of the bids.

Checks for plans and specifications shall be made payable to the State of New York. Proposal blanks and envelopes will be furnished without charge.

H. D. Tallamy, Superintendent
New York State Deartment of Public Works

Bids: December 22, 1953

George Washington Bridge

THE PORT OF NEW YORK AUTHORITY
NEW YORK EXIT PLAZA
SIGN BRIDGES—POSTS 20 AND 21
CONTRACT GWB-140.009

Sealed proposals for the furnishing and installation of sign bridges at the New York exit plaza of the George Washington Bridge will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1111, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M., Tuesday, December 22, 1953, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1111, and copies will be furnished upon deposit of $25.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, December 3, 1953.

Bids: December 29, 1953

Port Authority Building Tenth Floor Alterations

THE PORT OF NEW YORK AUTHORITY
CONTRACT EXD-130.010

Sealed proposals for performing alterations on the tenth floor of the Port Authority Building, 111 Eighth Avenue, New York 11, N. Y., will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1111, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M., Tuesday, December 29, 1953, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1111, and copies will be furnished upon deposit of $100.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, December 3, 1953

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4085) will be received at Denver, Colorado, until February 4, 1954, for furnishing one (1) 168-inch butterfly valve and controls, and turbine inlet pipe for Unit N-8, Hoover Power Plant, Boulder Canyon Project, Arizona-California-Nevada. Delivery is desired within 810 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4084) will be received at Denver, Colorado, until February 4, 1954, for furnishing one (1) 145,000-horsepower, hydraulic turbine, guard valve and turbine inlet pipe for Unit N-8, Hoover Power Plant, Boulder Canyon Project, Arizona-California-Nevada. Delivery is desired within 870 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4081) will be received at Bismarck, North Dakota, until January 5, 1954, for furnishing materials and labor for Jamestown-Fargo 230-kilovolt Transmission Line, Transmission Division, North Dakota, Missouri-Souris District, Missouri River Basin Project. Location: Between Jamestown and Fargo, North Dakota. Principal items are: Excavation for towersites, footings, and from borrow, 7,700 cu. yds.; excavation for type "A" footings, 7,500 lin. ft.; furnishing and driving treated timber piles, 53,000 lin. ft.; concrete in footings, 3,400 cu. yds.; erecting steel towers, 5,100,000 lbs.; furnishing and stringing three 954,000 circular-mil ACSR conductors and two ½-inch galvanized steel overhead ground wires for 86.1 miles of line; and other work. Completion time 840 days. For particulars, address Bureau of Reclamation, Bismarck, North Dakota; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

CONTRACTORS WATCH THIS SECTION
for New Projects
Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

OFFICIAL PROPOSALS

Bids: December 18, 1953

River Interceptors

PROJECT WVA 46-P-5A, UNIT ONE, SUB-SECTION 3 & 4
KANAWHA RIVER INTERCEPTORS, PATRICK STREET TO ELK RIVER
CHARLESTON, W. VA.

The Sanitary Board of The City of Charleston, Charleston, West Virginia, will receive sealed bids for "Kanawha River Interceptors, Patrick Street to Elk River" until 2 P M. Eastern Standard Time on the 18th day of December, 1953, at the office of The Sanitary Board, Room 15, City Building, at which time and place all bids will be publicly opened and read aloud.

ESTIMATED BID QUANTITIES
SUB-SECTION 3 Principal items
5400 lineal feet 60 inch diameter pipe sewer in tunnel, steel liner plate with concrete pipe lined and plain alternate.
400 lineal feet average 18" V.C.P. in tunnel regulator leads.
300 cubic yards regulator concrete.
390 vertical feet manholes.
SUB-SECTION 4 Principal items
3000 lineal feet 48" diameter pipe sewer in tunnel as in sub-section 3.
100 lineal feet 18" V.C.P. in tunnel.
20 cubic yards regulator concrete.
280 vertical feet manholes.
Pool level or above.
Sand or clay strata. Cores and data for contractors information will be available in two weeks. Furnished as addenda, but not guaranteed by the owner.

The successful bidder will be required to furnish a satisfactory performance bond in the amount of 100 per cent of contract.

Liquidated damages for delay will be One Hundred Dollars ($100.00) per day for each calendar day beyond the date specified in the contract.

The contract documents, including plans and specifications are on file at the office of The Sanitary Board, City Building, Charleston, West Virginia, and at the office of Settle Engineers, Inc., 2nd Floor Peoples Building, Charleston, West Virginia, where they may be examined free of charge.

Copies of the documents may be obtained by depositing Forty Dollars ($40.00) with Settle Engineers, Inc., 2nd Floor Peoples Building, Charleston, West Virginia, for each set of documents so obtained. The amount of the deposit for one (1) set of documents will be refunded to each actual bidder who returns the plans and documents in good condition within five (5) days after the opening of bids.

The Sanitary Board of The City of Charleston reserves the right to reject any or all bids and to waive any informalities in bidding.

A certified check or cashier's check, payable to The Sanitary Board of The City of Charleston, West Virginia, or a satisfactory bid bond executed by the bidder and a surety company authorized to do business in West Virginia, in an amount of dollars at least equal to five per cent (5%) of the bid or an equal amount of U. S. Government Bonds, shall be submitted with each bid.

No bid may be withdrawn after the scheduled closing time for receipt of bids, for at least sixty (60) days thereafter.

THE SANITARY BOARD OF THE
CITY OF CHARLESTON
By: F. Duane Hill, Secretary

Bids: January 28, 1954

High School Building

JANESVILLE, WISCONSIN

The Board of Education, Janesville, Wisconsin will receive sealed bids for providing all labor, materials, equipment and services necessary for and incidental to the construction and completion of the new High School Building and Heating Plant to be located at Ruger, Randall and Racine Streets, Janesville, Wisconsin, as shown on the plot plan, until 2 P.M., on January 28, 1954 at the office of the City Clerk of the City of Janesville, at which time all bids will be publicly opened and read aloud. All bids should be properly marked "Bid on Janesville Senior High School" and also marked to designate the contract for which each bid is submitted.

Bids will be received for separate contracts as follows:

BID A. General Construction including:
- a. Excavating & grading
- b. Concrete Work
- c. Structural Steel & Misc. Iron
- d. Masonry
- e. Carpentry
- f. Roofing & Waterproofing
- g. Sheet Metal
- h. Aluminum Work
- i. Lathing & Furring
- j. Plastering
- k. Tiling
- l. Terrazzo
- m. Painting & Finishing
- n. Glazing
- o. Resilient Flooring

BID B. Electrical Work
BID C. Plumbing
BID D. Heating & Ventilating
BID E. Elevator
BID F. Coal & Ash Handling Equipment

Plans, specifications and other Contract Documents are on file and may be examined at the office of the City Clerk of the City of Janesville; at the office of Law, Law, Potter & Nystrom, Architects, 121 South Pinckney Street, Madison, Wisconsin; at the Builders Exchange in Milwaukee, Minneapolis and St. Paul and at the F. W. Dodge Corporation offices in Chicago and Milwaukee, and at the Mechanical Exchange of Madison, 133 South Butler Street.

Plans, specifications and other Contract Documents may be obtained by depositing $60.00 for General Sets and $25.00 for Mechanical Sets with the Architects. The deposit will be refunded to bidders who submit a bona fide bid and return one set of plans and specifications in good condition not later than one week after bids are filed. $20.00 will be refunded for General Sets and $10.00 for each of all other sets returned.

No bid will be received unless accompanied by a certified check or bid bond equal to at least 5% of the bid payable to the City as a guaranty that if the bid is accepted, bidder will execute and file the proper contract and bond within seven days after the award of the contract. If the successful bidder so files the contract and bond, upon execution of the contract by the City, the check or bid bond will be returned. In case bidder fails to file such contract and bond, the amount of the check or bid bond shall be forfeited to the City as liquidated damages.

The right is reserved to reject any or all bids and to waive informalities. No bid may be withdrawn within 30 days after the scheduled time of closing bids.

Not less than the wage rates set forth in the contract documents, which have been established in accordance with the provisions of Section 348.50 Wis. Statutes, 1951, shall be paid.

The award of contracts will be made subject to the provisions of Section 66.29, Wisconsin Statutes, 1951.

Published by authority of the:

CITY OF JANESVILLE, WISCONSIN
By: Warren C. Hyde, City Manager
Harlen Bradford, City Clerk

Bids: December 15, 1953

Construction of River Spans

CITY OF LEAVENWORTH, KANSAS
MISSOURI RIVER BRIDGE
AT
LEAVENWORTH, KANSAS
NOTICE TO BIDDERS

1. Sealed bids will be received until 7:30 P.M. C.S.T., December 15, 1953, by the City Clerk at his office in the City Hall, Leavenworth, Kansas, and then publicly opened, for construction of river spans and east approach viaduct for the above named bridge, in accordance with the specifications, drawings and addenda.

2. The work for which bids are requested includes the following:

Contract No. 2, River Spans—Superstructure, two continuous tied arch spans, with the following approximate quantities: Carbon Steel 855 Tons; Silicon (or Low Alloy) Steel 850 Tons; Concrete Deck 485 Cu. Yds.; Reinforcing Steel 50 Tons; Aluminum Handrail 1,692 Lin. Ft.

Contract No. 2B, East Approach Viaduct, a continuous beam span structure, with the following approximate quantities: Carbon Steel 398 Tons; Steel Piles 8,100 Lin. Ft.; Concrete 920 Cu. Yds.; Concrete Deck 540 Cu. Yds.; Reinforcing Steel 130 Tons; Aluminum Handrail 1,469 Lin. Ft.

3. Each bid shall be accompanied by a cashier's or certified check, payable to the City, in an amount not less than five per cent of the total amount of the proposal. Bids and cashier's or certified checks may be held for a period of not more than sixty days after the date of opening; thereafter cashier's or certified checks will be returned to bidders not awarded contracts.

4. All work on Contract No. 2 except painting is to be completed within 360 calendar days after receiving notice to proceed, with completion of painting within 180 additional calendar days. All work on Contract No. 2B except painting is to be completed within 315 calendar days after receiving notice to proceed, with completion of painting within 180 additional calendar days. Delays must be compensated by liquidated damages; performance bond will be required.

5. Bidders may bid on either contract separately, or on both contracts. Award will be made for each contract separately, or for both contracts in combination, as may appear most advantageous to the Owner. Bidders shall not submit combination bids conditioned upon award of both contracts on an "all or none" basis.

6 Copies of plans and specifications are on file and may be examined at the office of the City Engineer, Municipal Building, Leavenworth, Kansas, and at the office of the Consulting Engineer, Howard, Needles, Tammen & Bergendoff, 1805 Grand Avenue, Kansas City, Missouri. Prospective bidders will be supplied with one set of plans and two copies of the specifications upon depositing $25.00 with the Consulting Engineer, which will be refunded upon return of the documents. Prospective bidders may secure extra copies of prints at 50 cents each and extra copies of specifications for $2.00 per copy.

7. Bids containing escalation and redetermination clauses will not be considered. The Owner reserves the right to reject any and all bids and to make the award without technicalities as to procedure.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
Consulting Engineers
1805 Grand Avenue
Kansas City, Missouri

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4082) will be received at Tucumcari, New Mexico, until December 23, 1953, for furnishing labor and materials for earthwork and structures, Drains 2, 6A, 6B, 10, 10A, 20, 50, and 51, Coulter Drain and rehabilitation of Ragsdill Drain—Tucumcari Project, New Mexico. Principal items are: 116,000 cu. yds. excavation; 162 cu. yds. concrete; furnishing and laying 1250 lin. ft. of 24-inch to 48-inch corrugated metal pipe; and furnishing and laying 3500 lin. ft. of 8-inch drain pipe; and other work. Completion time 150 days. For particulars, address Bureau of Reclamation, Tucumcari, New Mexico; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

GOV. OF DIST. OF COL., DIR. OF SAN'Y. ENG'G., Nov. 20, 1953. SEALED PROPOSALS will be recd. in Rm. 404, 499 Pa. Ave., N.W., Wash. 1, D.C., until 2 PM, EST, Dec. 17, 1953, and then publicly opened and read for constr. of Section No. 3 of E. Branch, Piney Br. Trunk Sewer, Kansas Ave. N.W., from Randolph to Varnum Sts., consist. of following: *In Open Cut:* 75 lin. ft. 4'6" and 35 lin. ft. 4'0" dia. brick & reinf. conc. masonry sewer; 12 lin. ft. transition sections; and 1 special manhole and junction chamber; and *In Tunnel:* 1235 lin. ft. 15'0"; 640 lin. ft. 14'6"; and 80 lin. ft. 5'0" dia. brick & reinf. conc. masonry sewer. Proposal forms, specns. and drawings, obtainable, upon deposit of a certified check, payable to Collector of Taxes, D.C., in the amount of $50.00 per set, from Supervisor, Contr. & Bond Sec., Procurement Office, D.C., Rm. 406, 499 Pa. Ave., N.W. (Tel. NA 8-6000, Ext. 2378).

OFFICIAL PROPOSALS

Bids: December 18, 1953

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 18th day of December 1953, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1 G. L. Nickerson, District Engineer, 353 Broadway, Albany, N. Y.				
		DISTRICT No. 2 L. Ketchum, District Engineer, 109 No. Genesee Street, Utica, N. Y.				
		DISTRICT No. 3 William Robinson, District Engineer, 301 E. Water Street, Syracuse, N. Y.				
		DISTRICT No. 4 E. G. H. Youngman, District Engineer, Barge Canal Terminal, Rochester, N. Y.				
		DISTRICT No. 5 C. R. Waters, District Engineer, 65 Court Street, Buffalo, N. Y.				
		DISTRICT No. 8 J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.				
Albany, Greene, Schen., Herk., Mad., Mont., Oneida, Cay., Onon., Seneca, Gen., Monroe, Ont., Erie, Oran., Rock., Ulster, West.	T.U.B. 53-1P	New York State Thruway—Hudson, Catskill, Mohawk, & Ontario Sections (Plumbing at Toll Plazas)	....	Sanitary Equipment & Sewage Treatment; Water Supply Wells: Water Purification and Distribution Equipment and Misc. Work at 40 Toll Plazas	$20,000 Plans $50	$340,000
Albany, Greene, Schen., Herk., Mad., Oneida, Cay., Mont., Onon., Seneca, Gen., Monroe, Ont., Erie, Oran., Rock, Ulster, West.	T.U.B. 53-1H	New York State Thruway—Hudson, Catskill, Mohawk & Ontario Sections (Heating at Toll Plazas)	....	Furnishing and Installing Heating and Ventilating Facilities at 40 Toll Plazas	$20,000 Plans $15	340,000
Albany, Greene, Schen., Herk., Mad., Mont., Oneida, Cay., Onon., Seneca, Gen., Monroe, Ont., Erie, Oran., Rock., Ulster, West.	T.U.B. 53-1E	New York State Thruway—Hudson, Catskill, Mohawk & Ontario Sections (Electrical Work at Toll Plazas)	....	Furnishing and Installing Electrical Facilities at 40 Toll Plazas	$33,000 Plans $25	600,000
		Note: Plans and proposals for T.U.B. 53-1P, T.U.B. 53-1H, and T.U.B. 53-1E may be procured only at our Albany and New York City offices.				
		DISTRICT No. 3 William Robinson, District Engineer, 301 E. Water Street, Syracuse, N. Y.				
Onon.	F.A.C. 53-18	Syracuse City: Adams Street Proj. U-446(4)	0.35	Asp. Conc. Ty. 2A=0.31 Mi. Misc. Work=0.04 Mi.	$12,000 Plans $10	227,000
		DISTRICT No. 4 E. G. H. Youngmann, District Engineer, Barge Canal Terminal, Rochester, N. Y.				
Monroe	O.T. 53-9	New York State Thruway—Ontario Section-Sub. 9 (Toll Plaza at Rte. 15 Interchange)	0.13	9" Cem. Conc. Pavt. 61' Wide, 0.03 Mi. Misc. Work =0.10	$1,800 Plans $10	32,0000
Monroe	P.S.C. 6014	Elimination of N.Y.C.R.R. (at Washington St.) with East Rochester-Penfield, S.H. 1337	0.35 Acc. 0.44 Hwy.	8" Cem. Conc. Pavt. 44' Wide=0.23 Mi. Asp. Conc. Ty. 3A=0.35 Mi. Misc. Work=0.21 Mi. R.R. Sep. Built-Up Beam 59.5'	$45,000 Plans $15	825,000
		DISTRICT No. 8 J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.				
Rockland	H.T. 53-9 R.C. 53-118 S.T. 53-32	New York State Thruway—Hudson Section-Sub. 8 (Suffern-Nyack Pt. 3) Palisades Interstate Parkway Interchange; 8 Misc. Sec. Roads; Coyles Corners-Short Clove, S.H. 9005 Rt. 303 Interchange;	5.77 Acc. 4.5 Thy.	9" Cem. Conc. Pavt. 2@ 25' Var. Wide=4.79 Mi. 8" Unreinf. Cem. Conc. Pavt. Var. Wide=3.26 Mi. Asp. Conc. Ty. 1A, Opt.=0.84 Mi. Grading and Misc. Work=1.04 Mi. R. R. Track Relocation=0.36 Mi. 7 Hy. Sepa. Comp. I-Beams 47', 218.8', 258.7', 259.6', 48.5', 90' and 251.4' 1 Br. Comp. I-Beam 62' 1 R.R. Sep. Comp. I-Beam 210'	$400,000 Plans $100	$7,620,000
West.	F.A.S.W.C. 53-2 F.A.S.T. 53-28 H.T. 53-7	New York State Thruway—Southern Westchester Connection-Sub. 11 (N. Y. City Line-Tuckahoe Rd Pt. 2) Tuckahoe Rd-Interchange: Hudson Sect.-Sub. 10-(Tuckahoe Rd.-Tarrytown) and 5 Sec. Cross Rds. Proj. UI-1100(1) Cont. #1	1.82 Acc. .39 Thy.	9" Cem. Conc. Pavt 2@ 37' Wide = 1.39 Mi. 9" Unreinf. Cem. Conc. Pavt. Var. Wide = 1.42 Mi. Asp. Conc. Ty. 1A, Opt.=0.30 Mi. T-C Graded Grav. (B.D.S.T.) = 0.10 Mi. 2 Hy. Sepa. Comp. I-Beams 132' and 168'	$220,000 Plans $50	4,000,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

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WANTED—BUILDING Construction Estimator —By old established North Jersey Company —Must be experienced with emphasis on Industrial Construction. Must have engineering background and be able to handle the complete estimate. Excellent Salary — Profit Sharing — Opportunity to advance — Age 32-42. P-9232, Engineering News-Record.

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DRAFTSMAN WANTED—Experienced for detailing miscellaneous and/or structural steel by Bushnell Steel Company. P. O. Box 2579, Jacksonville, Florida. Reply giving brief resume of experience, education, availability, and salary expected.

ESTIMATOR—PRINCIPAL duties Quantity Take-off, Experienced on Public Works, Institutional, Educational and Industrial Buildings, Bridges and related construction. Permanent position, excellent salary. Location, Maryland, state education, experience, age, references and availability. P-9854, Engineering News-Record.

OFFICE PROJECT Engineer 30-40 for contractor specializing in competitive bidding public buildings. Position requires job expediting, purchasing, and checking details. Graduate engineer or architect preferred. Stanley W. Newman Co., Mobile, Alabama.

WANTED TUNNEL superintendent experienced in rock and soft ground with tunnel following. State experience, age, reference and type of contract desired. P-9915, Engineering News-Record.

CHIEF ENGINEER with engineering company specializing in chemical plant design. This position requires a man with experience directing the design work of others including project engineers. This is a permanent position with a growing organization. Send complete resume of education and experience to P-9870, Engineering News-Record.

SALES ENGINEER to obtain contracts for engineering services. Contact work will be with industries in the Southeast and headquarters will be Atlanta. We require a man who has actual experience selling engineering services and can show results. Send complete information to P-9871, Engineering News-Record.

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CIVIL ENGINEER—General Municipal Technical and Administrative Duties $350 to $403 per month, commensurate with experience. Must be registered or eligible for registration in Wisconsin. Give full particulars in first letter. P-9934, Engineering News-Record.

WANTED: EXPERIENCED designer, with proven record in development of air actuated percussive tools as used in mining and construction industries. Also junior engineers with design aptitude to enter the engineering departments. Location—New York State. Our own employees know of this insertion. Apply, listing experience in full to Box P-9935, Engineering News-Record.

WANTED: CONCRETE Engineer. A leading producer of lightweight aggregates needs an experienced engineer with good background in concrete products and applications. Should know building construction, including roof and floor systems. Must be able to coordinate results from research and conduct training programs for sales personnel. Headquarters in Chicago. Earnings commensurate with ability. This is a solid opportunity with a sound, growing organization. Send complete resume. Replies held in strict confidence. Mr. D. J. Boone, V. P. Zonolite Company, 135 S. LaSalle Street, Chicago 3, Illinois.

ESTIMATOR WANTED: Permanent position with office of unequalled reputation in construction cost estimating. Applicant must be willing to learn and work to our standards of accuracy and thoroughness in quantity takeoff. Pleasant location in Central New England. Write, giving experience, education, etc. Dingman, P. O. Box 591, Palmer, Massachusetts.

ENGINEERS, EXPERIENCED in design of sewers, sewage treatment plants, water works, also Architects and Architectural Draftsmen. Reply, stating education, experience, salary requirements and when available. P-9936, Engineering News-Record.

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SALES ENGINEERS—Albany, New York and Pittsburgh, Pennsylvania with established national concern selling prefabricated metal products to engineering and construction markets. Position offered is permanent and presents excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Age 24 to 30. SW-8254, Engineering News-Record.

POSITIONS WANTED

DESIGN ENGINEER, 22 yrs. varied experience on large irrigation works (18 yrs. with U. S. Bur. of Recl.). Experience includes extensive hydraulic and concrete design; cost and quantity estimates; preparation of cost and progress reports; material expediting; training and supervising men in this work. Two years as Chief Design Engineer for multimillion dollar project in South America. Detailed experience record upon request. PW-9751, Engineering News-Record.

ARCHITECTURAL STRUCTURAL Engineer experienced in industrial and commercial design, field supervision and estimating desires position with Architects, Engineers, or Constructors. PW-9653, Engineering News-Record.

SUCCESSFUL CONSTRUCTION man, age 40, is interested in relieving you of most or all of your construction problems on grading, paving, drainage on highways, airdromes, floodwalls, etc. as top level supervisor. Reply PW-9750, Engineering News-Record.

(Continued on the opposite page)

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PW-9925, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS WANTED

(Continued from opposite page)

STEEL SUPT. 28 years supervisory experience. Reinforced Steel setting. Structural steel erection Misc. & ornamental iron erection. Precast concrete in Fabrication and Erection, cost conscious. Prefer Houston, Texas location or Southern contractor. PW-9740, 520 N. Michigan Ave., Chicago, Ill.

STRUCTURAL ENGINEER, licensed graduate, 28 years office and field, industrial buildings, chemical plants, waterfronts, underground structures, etc., available for permanent responsible position. PW-9195, Engineering News-Record.

CIVIL ENGINEER—Misce. 6 years experience in hydraulics, irrigation, specs and estimating. Consider either foreign or domestic position. PW-9920, Engineering News-Record.

CONSTRUCTION ENGINEER—C.E. graduate. Age 53, twenty-five years successful experience all phases large scale general construction and industrial chemical in direct supervision both in Field and Office. Top References. PW-9855, Engineering News-Record.

INSPECTOR—HIGHWAY and Airfield Construction. Recently completed contract in French Morocco as chief inspector of grading, drainage and paving. Will accept foreign or stateside position. PW-9835, Engineering News-Record.

GRADUATE CIVIL engineer with 25 years experience—design and construction of roads, bridges, sewers, water treatment and distribution, flood control. Just returned from 18 month contract in Venezuela. Desire new domestic or foreign assignment, preferably in warm climate. Write Box PW-9926, Engineering News-Record.

CIVIL ENGINEER—27—Registered—7 years experience earthwork, construction, technical training programs, project organization, costs, records, reports. Minimum $5200. PW-9938, Engineering News-Record.

FIELD OFFICE Manager, heavy construction. PW-9937, Engineering News Record.

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SUPERINTENDENT, BUILDING Construction, Registered P.E., 10 years construction experience building and estimating, desires permanent position, Southern States preferred. PW-9905, Engineering News-Record.

ESTIMATOR, GRADUATE civil engineer, age 30, single, five years experience in institutional and public works as estimator and project engineer. Desire position in southern states or California. Presently employed. PW-9919, Engineering News-Record.

STRUCTURAL ENG. Position wanted by reg. Eng. 30 yrs. exp. in struc. steel, orna. iron, steel stairs, misc. iron, conveyors, checking of mills, Mfg. bldgs., public bldgs., paper mills, ore concentration plants, coal processing plants, etc. Some mechanical experience. Box PW-9918, Engineering News-Record.

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POSITIONS WANTED

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ENGINEER: B.S. in C.E., 32, married. 10 years in supervision of construction, estimating, and design. Aggressive and loyal. Foreign service preferred, but not stipulated. Available 1 January 1954, sooner if necessary. Present salary $10,000. H. E. Rose, 1706 North 16th Street, Terre Haute, Indiana.

PROJECT ENGINEER, Resident, administrative civil, Mech., Industrial exper. Available foreign work, Orient, Europe, So. Amer. Smith, 1250 Thorain, San Antonio 1, Texas.

ESTIMATOR—HEAVY Construction. Extensive experience in Highway Bridges, Overpasses, Foundations, Excavation, Water Conditions, concrete in all phases. Handle Bidding, cost control, sub-contract negotiation, administration. Currently in responsible charge. Seek affiliation with New York City contractor or Consultant. (P.E.) PW-9809, Engineering News-Record.

POSITION WANTED: Experienced in general engineering duties in field and office on buildings, waterworks, sewers, sewage plants and pavements. Estimating, drafting, design, field layout, surveys and supervision of construction. PW-9879, Engineering News-Record.

CONSTRUCTION EXECUTIVE, available January 1st, or sooner. Thirty years experience, finished buildings, industrial work and heavy construction, both field and office. Organizer, with sound knowledge of purchasing, costs, field supervision and all other details from bid to completion. Seeking new connection as executive in Contractor's office or in charge of large project, where top man is required. New York or vicinity preferred. PW-9881, Engineering News-Record.

GENERAL SUPERINTENDENT—Now residing in Canada. Available on or about Dec. 10th '53. Proven record. Industrial and commercial buildings & heavy foundations, sound knowledge coordination of Sub Trade. Cost conscious. Best of references. PW-9895, Engineering News-Record.

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88-9897, Engineering News-Record
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W-9909, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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Two Good Used Steel Buildings
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16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
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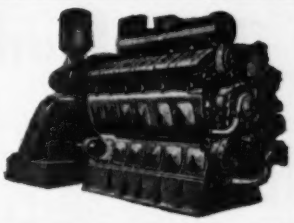

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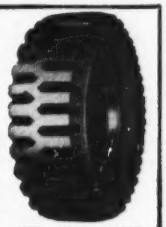

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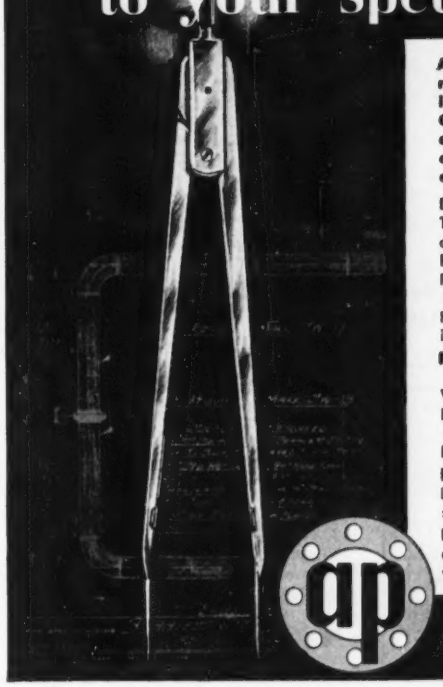

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NEW PRODUCTS

New roof design retards fire spread

One of the factors that aided in the wildfire destruction of General Motors' Livonia plant (ENR Aug 20, p.28 and Oct 15, p.24) was the spreading of fire by flaming streams of asphalt falling from the roof. Not too long afterwards, a spokesman for the Ford Motor Co. declared that that company would definitely not use the vapor-seal method in covering its proposed plants (ENR Nov 5, p.24).

But Ford's abandonment of the vapor-seal was made before company officials saw a demonstration of Lexsuco Corp.'s new roof design. Use of a vapor-seal is again being considered.

The Lexsuco design provides for a vapor barrier of 0.004-in. thick black vinyl plastic sheeting laid between the metal decking and insulation. The three components are pinned together with special clips to produce a fire retardant roof at a cost said to be competitive with usual methods.

At the demonstration for Ford officials last month, two roof structures—one of old-type construction and one of Lexsuco design—were subjected to intense heat while temperatures in different parts of the roof cross section were recorded.

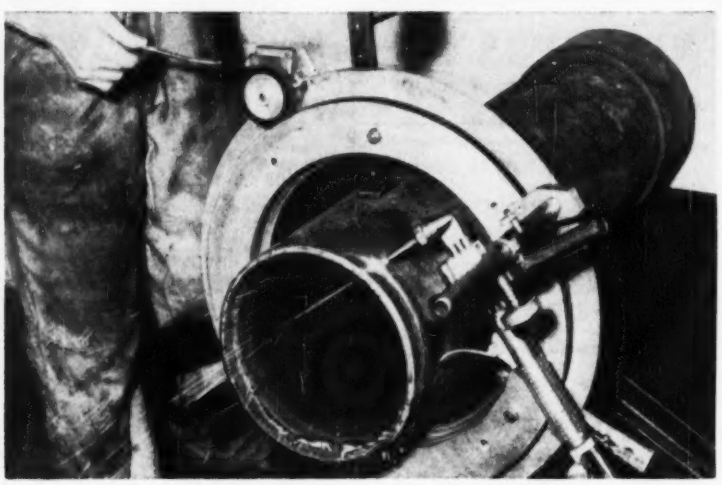
Six minutes after the fire was started the temperature immediately beneath the insulation on the conventional roof had reached 1,710 F—a minute or so later the roof collapsed. Temperatures under the insulation of the Lexsuco roof reached only 1,280 F after six minutes—the roof buckled only slightly.

According to fire officials on hand for the demonstration, the big differences in temperatures was due to the presence of flaming asphalt drippings as the conventional roof burned.

•**Faster laydown**—Construction of a Lexsuco roof eliminates the hot mopping and asphalted felt liners employed on older types. Instead, a single ply of fire-retardant vinyl sheeting is unrolled over the usual metal decking and covered with an acceptable insulation. The three materials—deck, seal and insulation—are then tied together by metal clips having special locking tongues to hold them fast after they have been hammered down through the metal deck.

Of course the vapor seal is punctured, but the elasticity of the vinyl sheet is said to make it virtually self-sealing around the shanks of clips driven through it.

The Lexsuco insulation clip is a modification of the Tinnerman Co. Speednut. It is a one-piece, heat-treated alloy steel fastener that may be used to pierce metal decking up to 18 gage and is available for insulation



A NEW PIPE CUTTER is reported to cut and bevel ten-inch steel pipe in two minutes. The device has a traveling carriage attachment and clamp that holds an acetylene torch in a fixed position in relation to the pipe as it rotates. A hand-operated crank is used to advance the torch. The one-man tool comes in two sizes: 2 to 12 in. and 10 to 20 in. Springload Mfg. Corp., 2412 Aurora Ave., Seattle.

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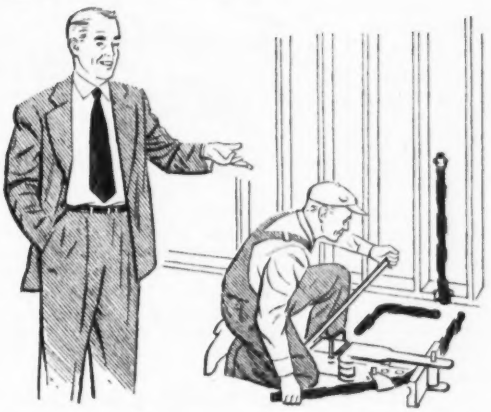

It costs less to do it right

—than to do it over!

When you specify pipe there are two things well worth remembering—

1. When you install it, you pay only the pipe fitter,

   but

2. Every time you repair it, you pay pipe fitter, carpenter, mason, plasterer, and painter.

This dollars-and-cents difference underscores the fallacy that low-first-cost materials are the answer to piping economy. And these same facts provide a yardstick that places the economy emphasis where it rightly belongs . . . on PIPE SERVICE LIFE. The longer service life of wrought iron pipe has proved to thousands of users that it costs less to do it right than to do it over. In installation after installation, wrought iron pipe has doubled, tripled, and even quadrupled the useful life previously obtained from low-first-cost piping. These users have discovered that although you pay a little more for wrought iron, you pay a LOT LESS FOR MAINTENANCE. Wrought iron gives you piping economy because it lasts longer, at lower cost per year.

We'll welcome the opportunity to discuss your particular corrosion problems, and to show you wrought iron durability records in services similar to those in which you are interested. Write or call. Your request will be handled promptly.

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NEW PRODUCTS

thicknesses of ¼, ⅜, 1, 1¼ and 2 in. Cost is about $25 a thousand.

Tests on fiberboard installation (1 in. thick x 1 ft sq) are reported to show that a pull of 175 lb was necessary to force the ½ x 1-in. head of the clip through the insulation. Similarly, 275 lb of pull was required to extract the clip from the metal deck.

It is pointed out that when used with glass fiber or cork-board insulation—both having a certain degree of compressibility—the clip will move with the insulation. If the clip is stepped on, the locking tongue being on the underside of the deck, the clip will move vertically with the insulation preventing tearing.

The recommended minimum number of clips to be used is one for every two square feet of surface area.

The vinyl vapor barrier (its use is optional) comes in 300-yd rolls, 54 in. wide and weighing approximately 80 lb. It is fire-retardant in that it will not support combustion—charring and deteriorating when heated rather than producing combustibles.

Normally the film is laid dry with 2-in. side laps that are cemented with Lexsucor lap cement. However, if desired, the film can be spot tacked to the deck with the same cement.

The lap cement is a gray, very tacky liquid that has no effect on the consistency of the sheeting. A gallon covers about 200 sq ft and costs about $1.75. In instances where a concrete roof deck is employed, the vapor seal can be cemented to the deck with this adhesive. In a similar fashion the insulation is cemented to the vinyl. LEXSUCO CORP., 4815 LEXINGTON AVE., CLEVELAND, OHIO.

Headaches in concrete curing eased by dusting powder

Duscure represents an approach to the old problem of retaining sufficient amounts of water in concrete to complete the hydration processes. A dry, white powder, the compound is dusted over the surface of newly laid concrete where it is said to form an elastic, moisture retaining film. In addition, the white color of the powder is reportedly effective in reducing surface temperatures and counteracting the effects of solar radiation.

The powder may be hand distributed or spread with standard dusting equipment. Duscure adheres to the surface so it may be used with equal effectiveness on flat or sloping surfaces. REARDON INDUSTRIES, INC., 2837 STANTON AVE., WALNUT HILLS, CINCINNATI 6, OHIO.

(*New Products cont. on page 106*)

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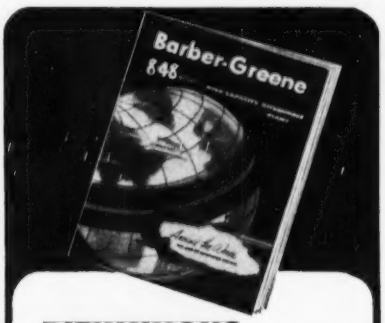

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Will Give New West Virginia Turnpike Years of Trouble-Free Service

Rugged terrain and deep fills mark the Giles Run portion of the 88-mile turnpike between Charleston and Princeton. Contractor on this section, Ralph E. Mills Co., Frankfort, Ky.

A typical Toncan drainage installation at Cabin Creek north of Sharon. This is an asphalt coated, 84-inch, beveled Toncan Iron Sectional Plate Pipe. Contractor, Nello L. Teer, Durham, N.C.

To insure proper drainage, Toncan Iron Drainage Structures are being installed at many points along the route of this new pike. Once in place, these structures will maintain their water-carrying capacity practically unchanged for years. Shifting subsoil and settling backfill will not fracture or crush Toncan Iron Pipe. Frost and erosion will never cause spalling to reduce water-carrying capacity.

Because Toncan Iron contains twice as much copper as ordinary copper-bearing steels and irons . . . plus just the right amount of molybdenum to make the copper most effective in resisting rust . . . the West Virginia Turnpike will get years of trouble-free service.

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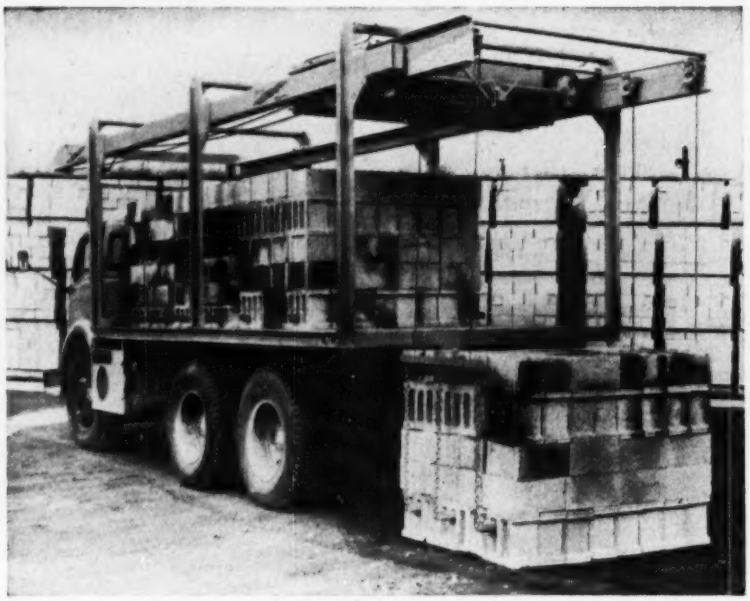

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The Lectro-Lift employs an electrically operated traveling carriage equipped with handling attachments. During loading the carriage is moved to overhang the rear of the truck bed. The simple pickup attachment is lowered by cable and attached to hollow cross pieces inserted through the bottom row of blocks to be loaded. An electric drive raises the blocks, travels the carriage and deposits the load on the truck bed. Unloading is simply the reverse operation. For both loading and unloading operations the pickup may be lowered eight feet below ground level.

The body is available in four bed lengths of 12, 14, 16 and 18 ft. Overall lengths of the unit are six feet longer than bed lengths since the track overhang must be included. Overall width of all units is eight feet.

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Mounted on a truck, tractor or dolly, the Hydro Sky Worker can carry one or two men to a working position at any point in space within a 26-ft radius of the mooring. Elevations up to 44 ft working height are possible with standard production models; greater heights can be supplied if necessary.

In addition to an articulated "elbow" that provides the equipment with its flexibility, special features include a fully insulated crow's nest, and insulated boom for protection against shocks on high-voltage work.

Working load capacity is 500 lbs, and full 360 deg rotation is controlled from the crow's nest. The mounting design of the new unit is said to be such that it allows ample body space on the truck for compartmentation and the carrying of a maximum load of auxiliary equipment. TEY MFG. CO., MILFORD, CONN.

MANEUVERABILITY has been provided in the Dart 10-S by designing the truck on a 100-in. wheelbase—turning radius is only 20 ft. The ten-tonner is powered with a six-cylinder Continental RD6572, 156-hp diesel—reportedly the highest horsepower rating of any comparable truck in its class. Full 60 deg dumping angle is attained in 10 sec with a twin, 6-in. dia, double acting, single stage hoist. Front springs are extra long to provide easier riding; rear springs are two-stage. Dart Truck Co., Oak & 27th St., Kansas City, Mo.

Trailed hopper conveyor eases ditch filling

A new hopper conveyor can be of aid in filling trenches, curbing, pipelines, etc., or for pipeline padding. The trailer unit is towed by a truck loaded with fill material, and as the load is dumped from the truck to the hopper a conveyor belt carries the material off to the side to be deposited in the trench.

The hopper conveyor is designated Model 600 and is powered by an 8-hp gasoline engine that drives a 14-in. wide conveyor belt. Controls are mounted at the operator's platform for adjustment of belt speed, amount of material fed through the bottom of the hopper and placement of the fill material. Placement of the fill is directed by an adjustable deflector. Speed of the towing truck and conveyor belt and the amount of material carried by the belt determine the rate of fill delivered. Maximum capacity is three tons per min and maximum belt speed is 500 fpm.

Added flexibility is gained in that the conveyor is removable since the conveyor can be removed and the unit used as a spreader.

The hopper conveyor is equipped with four wheels—the front pair are swivel mounted—so that the unit may be towed from job to job by car or truck without the need of a trailer. Net weight of the Model 600 is 2,100 lbs. Bulletin C-2 carries additional information. POWER-PACK CONVEYOR CO., 13910 ASPINWALL AVE., CLEVELAND 10, OHIO.

New grouser shoes give better traction

Better traction and increased resistance to slipping during sidehill work are claimed for a newly designed grouser shoe. Curved and straight surfaces produce a grouser bar with 15% more ground surface contact without a corresponding increase in total width or weight.

In addition to better performance, the shoes are reported to last longer because of their manganese steel construction and the use of raised bosses around countersunk bolt holes to protect the bolt heads from wear, distortion and loosening. Further, grouser ends are reinforced to equalize wear and reduce the tendency to rounding at the outside corners.

Renewable regrousering bars are available that retain the curved gripper shape. ENGINEERED EQUIPMENT CO., 9716 ATLANTIC AVE., SOUTH GATE, CALIF.

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PUBLICATIONS

Oil-type clutch—A new broadside illustrates the Caterpillar D6 tractor that is now equipped with the new oil-type flywheel clutch. Included are illustrations and sectional cutaways of the tractor and a detailed specification sheet. Form 30825.—CATERPILLAR TRACTOR CO., PEORIA 8, ILL.

Welding chart—A new wall chart of welding rods, 22x34 in., is arranged for ready reference to assist in the selection of the proper welding alloy for this specific job. The new Rod Selector Chart lists over 160 different Eutectic Low Temperature Welding Alloys, their bonding points, tip colors, tensile strengths, etc. The rods are classified by type of metal and further subdivided by arc or torch applications. A brief description of the main uses for each rod and electrode gives the user reference material to assist in most efficient use of the materials listed.—DEPT. "P," EUTECTIC WELDING ALLOYS CORP., 172ND ST., & NORTHERN BLVD., FLUSHING 58, N. Y.

Stationary and traveling scaffolds—A 4-page folder explains the panel and brace locking feature of Advance tubular steel scaffolds. It includes illustrations of the self-contained cam and stack locks which permit speedier erection and dismantling of scaffolds through elimination of nuts, bolts, clamps and other time-consuming methods of assembly. Folder No. 51.—ADVANCE SCAFFOLDS DIV., BEAVER ART METAL CORP., DEPT. D-24, ELLWOOD CITY, PA.

D8 pusher—A new broadside describes application of the D8 to push-load in tandem by using a C-frame and push block. Speed and economy in getting scrapers loaded are stressed in reporting on the versatility of the crawler tractor. The folder is illustrated and includes a detailed cutaway drawing of the new oil-type clutch. Form 30903.—CATERPILLAR TRACTOR CO., PEORIA 8, ILL.

Aid for purchasing agents—A special data sheet has been prepared that lists the various service conditions affecting wire rope. By distributing it to the executives and engineers in his company who requisition wire rope, a purchasing agent can quickly obtain the essential information and thus possibly effect important savings for his employer. Prime purpose of the booklet is to enable non-engineers to write specifications for wire rope.—BERGEN WIRE ROPE CO., LODI, N. J.

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EDITORIALS

Collective bargaining for engineers

THERE IS MUCH FOOD FOR THOUGHT in the findings of the survey of opinions relating to collective bargaining just completed by the American Society of Civil Engineers (ENR Nov. 12, p.28). No one who approaches that controversial question realistically can brush off as inconsequential the fact that of the 17,200 members who replied, 4,200 stated that they believe they would benefit from collective bargaining. Only 624 of those who replied actually are in bargaining units at the present time.

Also of interest is the finding that of the 10,000 older and presumably more conservative men who replied—the members and associate members—2,100 saw no objection to collective bargaining by engineers.

This would appear to indicate a radical departure from the thinking of two decades ago when it was feared that the upsurge of the union movement that followed passage of the Wagner Act was going to result in many employed engineers joining a union. Then there was an almost hysterical effort to make it appear that there is something unprofessional about collective bargaining.

Since then there has been a slowly growing recognition of the fact that, fundamentally, collective bargaining is an economic question. Where a professional question comes in is not in the collective bargaining itself but in the way the bargaining is conducted. There was nothing ethical or professional in the way the old-line trade unions conducted their bargaining; and the whole trade-union system appeared to be designed to put a check on the ambitious individual who wanted to get ahead on the basis of demonstrated ability, which is the way engineers like to work.

Since that time a few collective bargaining groups made up largely of men employed on work that is classified as professional under the Taft-Hartley Act have succeeded in conducting their bargaining on a basis that calls for no compromise of professional or ethical standards. But not all are doing that. Some of the organizations now in the Engineers and Scientists of America appear to be slipping back into the old trade union pattern. The ESA attack of last spring on the so-called non-bargaining groups of engineers at congressional hearings falls into that class.

Where responsibility for this lowering of standards lies is not easily determined. Employers may be largely responsible. If they refuse to act when approached in a moderate manner, the ESA representatives cannot be too severely criticized for using tactics that trade unions have found to be effective.

Such a situation appears to place a special responsibility on engineers who are on the management side, especially those in big organizations employing many engineers. Some form of collective bargaining for most employees in such companies appears inevitable. Hence, if engineers on the management side want to help the engineering employees keep their bargaining on a high level they must see that management responds to that type of approach in a fair and businesslike manner.

Realistic highway planning

AN APPEAL TO CONGRESS for a large increase in federal aid for highways is expected to be made early next year by the American Association of State Highway Officials. At its annual meeting in Pittsburgh (ENR Nov. 19, p.25) the association sent to its members for approval a resolution calling for an increase in the annual federal-aid authorization to $900 million from the present $550 million. Two-thirds of the state highway departments must approve before this proposal becomes the official AASHO program for federal aid.

This new program also calls for two other major changes in federal policy. It seeks to have federal highway aid apportioned to the states on the basis of population, instead of the current formula that also takes into consideration area and mileage of post roads in each state; and the AASHO proposes that the cost of all construction on the Interstate System of highways be shared on a 75% federal, 25% state basis instead of the present 50-50 basis.

This is a departure from the traditional AASHO stand of insisting that the states match federal funds dollar for dollar, but in view of the fact that most of the 38,000-mile Interstate System is below tolerable standards the departure is desirable as an expedient designed to concentrate work on a network of highways that is basic to the nation's economy.

And the proposed change in the apportionment formula to give more federal aid to the populous areas has been long overdue. A larger annual highway building program is most needed in those states, and they supply the major part of the national government's income from the federal gasoline tax.

Finally, the AASHO is not going to support the state governors in their drive to get the federal government to retire from the field of gasoline taxation, leaving that field to the states exclusively. In theory that proposal has much in its favor, but in practice it probably would result in a drastic cut in federal aid for highways, if not complete abandonment of that aid, before many states could get their citizens to approve an increase in the state's gasoline tax to offset the lost federal aid.

This new program for federal aid indicates clearly that the AASHO has its feet firmly placed on the ground. We hope Congress will be equally realistic when the time comes to write the next federal-aid highway act.

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